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ADDRESSES AND ORIGINAL ARTICLES

NEW BONES FOR OLD *

By E. W. Hey Groves, M.S., M.D. Lond., F.R.C.S.
EMERITUS PROFESSOR OF SURGERY IN THE UNIVERSITY OF BRISTOL

"The valley . . . was full of bones . . . and, lo, they were very dry. And he said unto me, Son of man, can these bones live? And I answered, O Lord God, thou knowest."—Ezekiel, 37, 1–3.

ALTHOUGH the making of new bones for old by bone-grafting has been established now for many years and its general principles accepted, the subject still attracts much attention, and new suggestions are constantly being put forward to make the process of bone formation more certain and more rapid.

Bone differs from all other living tissue in the very large proportion of its mineral constituents. The building up of a bone, whether in the natural process of growth or in the reconstruction of a bone by grafting, is a matter of the vital tissues laying down and enclosing themselves in a mineral skeleton. When the bone is fully constructed the mass of mineral constituents far exceeds that of the vital. The vital elements are collected on both surfaces of the long bone—i.e., under the periosteum and in the endosteum or spongy bone. The dense cortical bone which lies between these two collections of the vital elements is traversed by the minute Haversian canals, which transmit the vital structures. The vital elements (osteoblasts, blood-vessels, &c.) which are essential for building the new bone must be derived from the living tissue of the body and from osteogenic tissue. The mineral constituents, however, may be derived from any foreign bone—i.e., from any dead animal bone.

* The substance of a British Medical Association lecture delivered at Scunthorpe on Oct. 12, 1938.

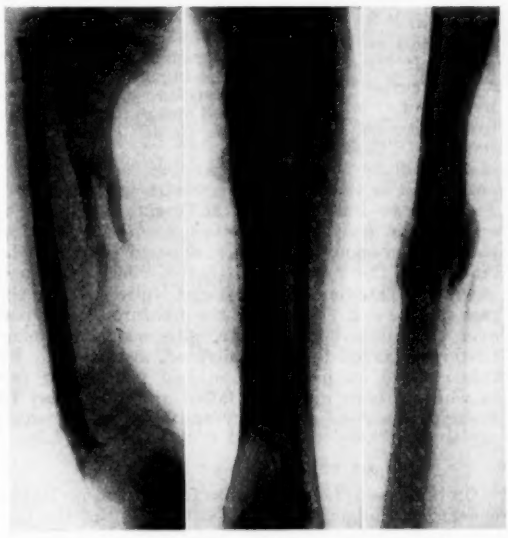

FIG. 1—Fate of autogenous graft after loss of tibial diaphysis. A, radiogram taken just before operation on a boy aged 13 with osteomyelitis; B, radiogram taken 6 years later; C, radiogram of autogenous graft in tibia of a boy aged 12, taken 6 months after operation. Graft has fractured and shows callus repair.

FATE OF AUTOGENOUS GRAFTS

According to the generally accepted theory of autogenous grafting the graft itself always dies and then acts merely as a scaffold into which the vital elements of the host bone penetrate. Thus every autogenous graft undergoes three phases: death; invasion by the granulation tissue, osteoblasts, and blood-vessels of the host; and homogeneity of the tissues of the graft and host. This rather astonishing conception depends entirely on the negative findings of research workers, who always find that the vascular spaces of the graft are empty at a certain period after grafting. Almost certainly it is not the whole truth; for, if it were true, then a big animal bone would give the same results as a piece of living bone when used as a graft. When such a graft is buried in a living bone and is surrounded by the latter on every side, the dead and the living graft behave similarly. But if on the other hand the graft is made to fill a gap and has contact with living bone only at its two extremities, the living graft will survive and become incorporated in the skeleton, whereas a dead animal bone would be absorbed or extruded.

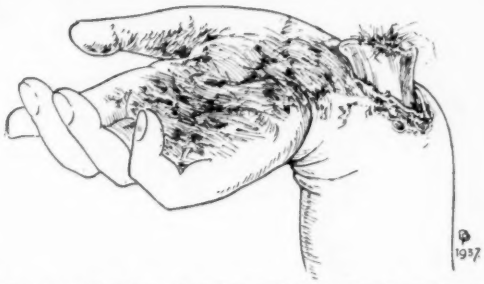

FIG. 2—Right hand showing radial diaphysis projecting through skin.

Two cases in which the greater part of the shaft of the tibia had been lost, either by osteomyelitis or by diaphysectomy, show these points very clearly.

The first case (fig. 1, A) is from a boy aged 13 at the date of the operation. The radiogram taken six years later (fig. 1, B) shows that the grafted bone has grown to be of the size and thickness of the normal tibia.

In the other case a boy, aged 12, had a similar autogenous bone graft, and the radiogram (fig. 1, C) was taken six months later, showing that the middle of the graft has broken, but that already there is evidence of callus repair. It would be difficult to believe that the vital tissue responsible for this repair had grown all the way from the end of the graft to its middle portion in a period of a few months.

Clinical experience has shown that the success of autogenous grafting requires the fulfilment of three conditions: an aseptic vascular field; wide contact between the graft and the host; and firm fixation. It would be easy to multiply examples of how failure in any of these respects brings about failure in the grafting.

FIG. 3—Radiograms showing revitalisation of bone in radial diaphysis. A, 3 months; B, 5 months; C, 7 months; D, 9 months; E, a year after accident.

REVITALISATION OF BONE

We are accustomed to speak of "dead bone" or a sequestrum as though such a bone were necessarily doomed and must be removed. This is an error. Orell, the inventor of os purum and os novum, has successfully carried out the daring experiment of removing a large portion of diseased bone, boiling it for twenty minutes, and then replacing it, where it has survived and functioned (Orell 1938). I will give a less dramatic instance of the same revitalisation of bone.

A boy, aged 13, fell from a tree, his two outstretched hands striking the grassy soil below. Both arms sustained a separation of the radial epiphysis, but on the right side the shaft of the bone was thrust nearly an inch through the skin (fig. 2). He was seen within one hour of the accident, a careful excision of the wound and thorough cleansing were done, and the displaced bones were corrected on both sides. He made a satisfactory recovery, although for nearly a week we greatly feared that an anaerobic infection had taken place, because of the characteristic odour. However, within a month, except for a little discharge from the wound, all seemed doing well. We were greatly disconcerted at the end of three months to find by radiography that the lower part of the radial diaphysis, corresponding almost exactly to the piece of bone which had been extruded, was disintegrated, having broken up into four pieces (fig. 3, A). If it had not been for the boy's good condition and the healthy appearance of the hand and arm we certainly should have excised this disintegrated bone. This would have involved a difficult reconstruction later on. So it was decided to "wait and see."

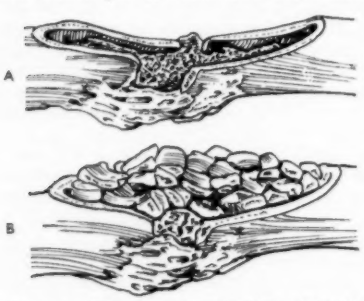

FIG. 4—Diagrams illustrating Matti's grafting of spongiosa. A, area of fracture prepared and crevices filled with spongiosa; B, bone chips covering fractured area.

To our surprise and delight, each month then showed a gradual reconstruction of the bone (fig. 3, B–E), so that now, just a year after the accident, the lower end of the diaphysis is solid, and, although the growth of the radius has been checked, the boy can play cricket and throw the ball as far as his fellows.

MATTI'S GRAFTING OF SPONGY BONES

A comparatively recent method of increasing the rate and extent of bone growth, especially in dealing with ununited fractures, consists in using spongy bone, rich in vital elements, to supplement bone repair (Matti 1936). Thus in an ununited fracture of the shaft of the tibia the area of fracture is exposed and the bone is widely guttered until all the exposed surface presents a freshly bleeding surface. The pieces of bone cut away in making this exposure are preserved. An area at the base of the great trochanter is exposed, a trap-door removed from the cortical bone, and a spoonful of tissue scraped out from the interior of the bone, consisting of blood, fat, and marrow. This semi-fluid material is pressed into the raw surface and crevices of the fractured bone, and over this little bits of bone, into which the bone already removed has been divided, are placed. By this method an indolent ununited fracture or one in which a bone graft has failed or broken may be brought to a state of healthy and strong bony union (fig. 4).

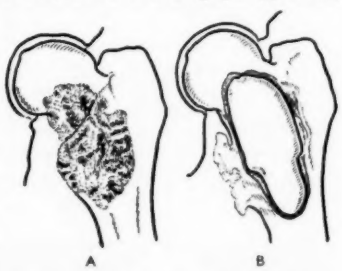

FIG. 5—Ivory graft in neck of femur. A, femur showing fibrocystic disease before operation; B, same femur with diseased area excised and filled with walrus tooth, 7 years after operation.

OS PURUM AND OS NOVUM

Orell, a Swedish surgeon, has followed to its logical conclusion the generally accepted theory of the fate of a bone graft—the death and resurrection theory. He argues that, if the bone graft is a mere scaffold, a piece of purified dead bone will not only serve the purpose but will save time and the operative removal of the bone graft. From animal bones therefore he produces various pieces of dead bone, which are purified by chemical and mechanical processes but not boiled. This he terms os purum. It is

used in various bone operations in which the graft is placed in complete contact with living bone, particularly in various types of arthrodesis, when the struts of os purum have proved very useful in bringing about a bony union. But he has ventured a step further. He argues that, if the addition of vital elements is to be the next stage in making the dead graft live, then this stage too can be initiated before the transplant is made. Suppose a case of tuberculous spine requires a bone graft. Orell takes a piece of os purum of the necessary size and shape and implants this under the periosteum of the patient's tibia. Three months later the animal bone is removed, and it is found by this time to be covered with adherent granulation tissue. This is os novum, which consists of the mineral bony framework provided with a covering of vital elements from the patient's own tissues. The strip of os novum thus obtained is then transplanted into the prepared bed in the patient's spine.

These methods and ideas regarding os purum and os novum are too recent to allow of critical examination. The practical value of os purum in supplementing other methods for arthrodesis or the treatment of ununited fractures is generally admitted, but it is very doubtful whether os novum really represents a living bone, and there can be no question that it is much inferior to the autogenous graft in its power of reproducing new bone.

USE OF ANIMAL BONE

It has long been known that animal bones can be used in the repair of defects in the human skeleton. In some respects an animal bone is superior to a living bone graft, for it can be precisely shaped beforehand to the exact size wanted and, what is more important, it can be used in such a size and strength as could not be obtained from the patient's own skeleton. Three examples may be given of the use of animal bone in repairing human defects. I have chosen these because they exemplify the use of different types of animal bone. In the first example ivory was used to secure a strong substitute for the upper end of the femur. That piece of ivory, from the eye-tooth of a walrus inserted sixteen years ago, remains in place without the slightest sign of change or absorption (fig. 5).

The patient, a farmer's boy aged 18, had a large cavity in the upper end of the femur, which showed

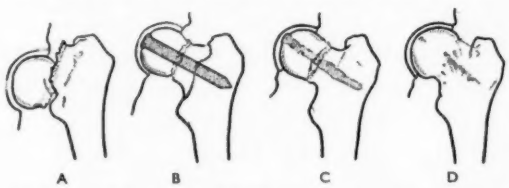

FIG. 7—Stag's antler graft in femur. A, before operation; B, 2 months later; C, 1 year later; D, 2 years later.

evidence of early fracture. It was impossible to find any piece of human bone large enough to fill this cavity unless mere chips had been used. So a piece of ivory was taken from a walrus tusk and correctly shaped. Through a posterior incision a trap-door was made into the neck of the femur, and the fibrous tissue filling the cavity was shelled out and replaced by the ivory mass. He made a smooth recovery, returned to work in six weeks, and has never had any disability or illness since. The operation was done in 1922 and when he was seen in October, 1938, a fresh radiogram showed that the ivory graft had remained without change as a strut round which human bone had been deposited.

The second case illustrates the use of beef bone, which has the advantage of being easily and quickly obtained and can be used in a very massive form. When buried in human bone it is very slowly but surely incorporated in it.

A boy of 10 had fibrocystic disease of the right humerus, the bone breaking as the result of his throwing a cricket ball. The diseased area was about 2½ in. long in the very middle of the shaft of the humerus (fig. 6, A). If it had been merely opened and scraped out, even if filled with bone chips, a long period would have been necessary for recovery, and there would probably have been some shortening of the arm; so it was decided to reconstruct the humerus with the help of beef bone. Two pieces of ox tibia were shaped and fitted. Each was rod-shaped at one end to fill the narrow cavity of the humerus and overlapping at the other so that when joined together it would take the place of the defect in the humerus. The cystic portion of the humerus was removed (fig. 6, B), one piece of beef bone was driven up and the other down into each fragment, and the two were bolted together (fig. 6, C). He made a smooth recovery and returned to school within six weeks, not having to wear any splint. By a curious chance he not only grew normally but became a very tall athlete and actually won the weight-throwing competition in the inter-varsity sports. The length and general structure of the affected humerus is exactly the same as that of the left side, but a ghostly shadow of the beef bone could still be traced in the midst of the human tissues ten years after its insertion (fig. 6, D).

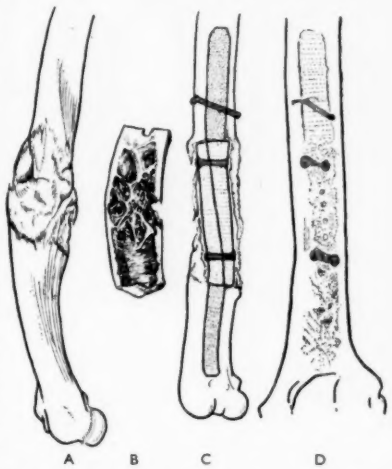

FIG. 6—Beef-bone graft in humerus. A, humerus showing fibrocystic disease before operation; B, part of humerus excised; C, two pieces of ox tibia replacing central part of shaft of humerus; D, same case 10 years after operation.

In the third case the animal bone was taken from a stag's antler. It had occurred to me that, since the large mass of the antler is produced by a very rapid process of growth, the antler being reproduced each year, the bone of which it is composed must be highly porous and homogeneous; from a practical point of view, too, the stag's antler has the advantage of presenting a solid rod without a marrow cavity.

A woman, aged 45, had an ununited fracture of the neck of the femur of one year's standing. The hip-joint was exposed through an anterior incision and the head of the femur nailed on to the shaft with a previously constructed bone peg, 3 in. long and ⅜ in. wide, made from a stag's antler. She made a good recovery and a year later could walk so well that it was impossible to detect which had been the damaged leg. Radiograms showed that within three

years the bone peg had been completely absorbed and replaced by the human bone (fig. 7).

SUMMARY

(1) The use of living autogenous grafts taken from the patient's own skeleton remains as the standard method of repairing bony defects. (2) The success of the autogenous graft depends on an aseptic field, accurate fitting, and firm fixation. (3) The use of living bone chips, particularly of the spongiosa, is an important adjunct to other surgical methods, especially in ununited fractures. (4) Exceptionally the use of animal bone is indicated, especially when strength is required.

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INTESTINAL STRICTURE AND MEGALOCYTIC ANÆMIA

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THE association of megalocytic anæmia with intestinal stricture is well established but comparatively rare. In 1929 Meulengracht collected 21 recorded cases and described a further one. In 1936 Hawksley and Meulengracht reported another and referred to three more which had been described since 1929. A further example of the condition is here recorded in which the blood picture in addition to being megalocytic was also hypochromic, and showed many erythroblasts. This very unusual blood picture has been described by Cooley (1927) and others as part of a disease occurring only in children of Mediterranean stock. It has twice been described in adults and both suffered from idiopathic steatorrhœa (Bennett, Hunter, and Vaughan 1932).

CASE 1.—A single woman of 62 was admitted into the private block of Addenbrooke's Hospital on Jan. 28, 1937, and died on Feb. 15. She had been treated for a number of years as a case of idiopathic steatorrhœa or adult cœliac disease, but had never been willing to come into hospital for full investigation. Her family history was good. Her father died of heart disease at the age of 72 and her mother had remained healthy to a considerable age. There were nine brothers and sisters, alive and well, one brother having died of tuberculosis when 24. The patient had never been abroad until she reached adult life, when she had visited France, Switzerland, and Germany. Since infancy she had been regarded as the delicate member of the family and had been ailing. Her sister recalled that family expeditions were often broken up because the patient had an attack of diarrhœa. She also recalled that when the patient was one year old after a move from Norwich to Thetford, there was much illness in the family, culminating in a serious illness of the mother. It was then discovered that the drains of the house were leaking, and the illness of the mother was attributed to this leakage. It is possible therefore that the patient at the age of a year had some serious illness borne by sewage contamination of the water. Her sister also states that she had an impression that the patient suffered from rickets as a child, but she could give no definite information on this point. At the age of 14, however, it is certain that the patient's knees became bent and for this she was put to bed in leg splints for two years. At 16 she had attacks of cramp in her knees, and she says that these have recurred since. No more convincing evidence of tetany can, however, be obtained than this single observation.

The more definite part of the patient's story begins at the age of 29, when she had a severe attack of diarrhœa which kept her in bed for about four months. A year later she developed a goitre which was treated by long rest cures. The goitre disappeared after four or five years. After this she was fairly well and lived a comparatively normal existence, but was never able to engage in any strenuous pursuits, and apparently was overcome from time to time by attacks of diarrhœa. During this time she was often subject to attacks of bronchitis, and once was suspected of having pulmonary tuberculosis. This suspicion was, however, not confirmed. About 1933 she was seen by a physician in London, who discovered that she had megacolon.

Her doctor reports that she had always been subject to anæmia, but until 1933 the anæmia had always responded to iron. Accurate records of her blood pictures are available after 1933, and are given in table I. Her doctor reports that in 1933 for the first time her anæmia failed to respond to iron, and she was given liver treatment by mouth with considerable improvement. In fig. 1 it will be seen that at this time she had a megalocytic anæmia, which improved at first and relapsed later in the year.

In 1935 she had a recurrence of her diarrhœa and was in very poor health. The diarrhœa at that time was attributed to colitis and she was given frequent rectal irrigations. Her anæmia was so severe that she was given three blood transfusions about March, 1935, and there was definite improvement in her blood during the next few months. In June, 1935, she was seen by another physician, who regarded her as having adult cœliac disease or idiopathic steatorrhœa. He reported that she had

TABLE I—BLOOD COUNTS PRIOR TO ADMISSION OF CASE 1

Date	R.B.C. (millions)	Hb. (per cent.)	C.I.	W.B.C.	—
1933. Mar. 31	2·25	50	1·11	6,900	Poikilocytes, nucleated red cells, megalocytes.
June 30	3·95	78	1·0	10,800	—
Oct. 17	2·90	65	1·12	11,600	—
1935. Mar. 20	3·10	22	0·35	7,800	A few nucleated red cells but no other signs of pernicious anæmia.
Apr. 15	3·35	30	0·45	8,800	—
June 24	3·33	52	0·79	11,400	Anisocytosis. Some large cells present.
Nov. 15	2·71	40	0·70	8,800	Marked anisocytosis. Some poikilocytosis.
1936. Feb. 12	2·73	64	1·18	12,400	1 normoblast seen in counting 200 white cells. Many large cells. Halometer 8·2.
Apr. 3	3·07	62	1·01	12,600	Anisocytosis +. Large forms present.
May 15	3·61	84	1·08	7,800	Anisocytosis +. Large forms +. Normoblasts.
Sept. 25	3·20	52	0·84	5,600	—

pernicious anæmia and a pellagra-like condition of the skin, and possibly suffered from a deficient absorption of fat-soluble vitamins. He recommended hydrochloric acid by mouth and concentrates of all the vitamins, with calcium and weekly injections of liver extract. She did not coöperate very well in this régime, and for most of the summer she was having injections of liver at three-weekly intervals and little other treatment. Her blood picture at

this time was definitely hypochromic and there was obviously no improvement.

Early in 1936 she was given large doses of iron, and following prolonged treatment in this way her blood in May, 1936, was in a better state than it had been

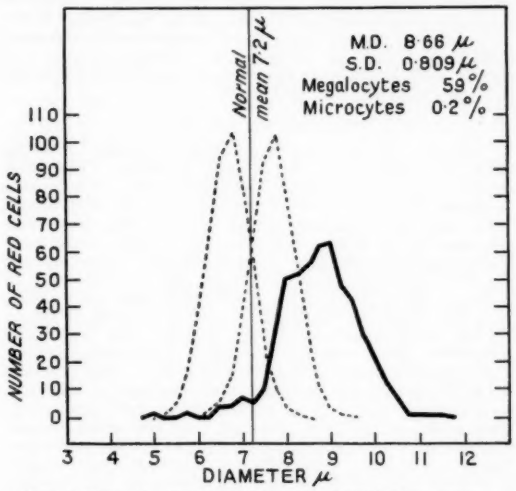

FIG. 1 (Case 1)—Red cell diameter distribution curve.

for a long time. The hæmoglobin reached 84 per cent. and the colour-index was considerably above unity. In February, 1936, she had had a severe attack of retrosternal pain which was thought to be caused in part by her anæmia, which at that time was of the megalocytic type. Ventriculin was prescribed, but she said that she could not take it as it caused diarrhœa. She was therefore given weekly injections of intramuscular liver, but in spite of this treatment in May, 1936, her colour-index was still high. In September, 1936, the colour-index had dropped again to 0·9, although there is no record of her having any intensive liver therapy throughout that summer. In November, 1936, she was seen by yet another physician because of recurrent attacks of vomiting and diarrhœa with considerable loss of weight. He confirmed the diagnosis of idiopathic steatorrhœa, and recommended a low fat, non-irritating diet. The total fat in her stools at this time was 34·6 per cent. of the dry matter, and 75 per cent. of this fat was split. There is no record of her stools having been analysed for fat previously, and she had never been put on a low fat diet. Weekly injections of Campolon were advised at the same time and on this régime she was comparatively well and actually put on weight. But early in January, 1937, following the discontinuance of the campolon, she relapsed. At this time her weight was 4 st. 4 lb. and the stools contained 29·6 per cent. of fat, of which 60 per cent. was split. She stated that she had never been more than 7 st., and that in recent years she had been just over 6 st. During 1936 she had been round about 5 st.

Because of numerous recurrences of diarrhœa and vomiting she finally consented to come into Addenbrooke's Hospital for a more complete investigation. She was a poor diminutive skeleton, with loose, dry, inelastic skin. There was a general light yellowish-brown pigmentation of the skin, but no pigmentation suggesting pellagra. She was obviously anæmic and her weight was 4 st. 4 lb. Her tongue was smooth at the tip, and red and sore, but further back both fungiform and filiform papillæ were well seen. Apart from the general cachexia there was very little of note in the physical examination. The chest showed slight scoliosis to the right, but there were no abnormal physical signs in the lungs. There was no enlargement of the heart; the heart sounds were normal, and the blood pressure was 124/70. There was no peripheral arterio-sclerosis, and no œdema. The abdomen was slightly distended, with coils of intestine visible through the abdominal wall. Neither spleen nor liver was palpable, and there was no tenderness to pressure. The thyroid had a slight diffuse enlargement, with a hard nodule in the isthmus. Axillary hair was absent; otherwise the distribution of the hair was normal. There was no koilonychia.

A broad high forehead, and a wasted, wizened lower part of the face gave her the appearance described as suggestive of erythroblastic anæmia, as in the picture of Case No. 6 in Bennett, Hunter, and Vaughan's paper. It is difficult, however, to be certain that this was anything more than a combination of a high forehead with a rather wasted lower face.

In the central nervous system very little of note was found apart from a small atrophic patch in one ocular fundus, suggesting an old hæmorrhage. The tendon reflexes were all present and sensation was normal. There was no loss of vibration sense and Chvostek's sign was negative. The stools were pale and looked fatty, but were not bulky or frothy. The patient was in a very nervous excitable state, and was upset by any interference, such as venepuncture. She was therefore put on a low fat, low starch, high vitamin diet, with the addition of all the vitamin concentrates, iron, and campolon, and most of the laboratory investigations were postponed in the hope of being able to get her into a better state of health. Unfortunately her general condition deteriorated steadily, and she was greatly troubled by intermittent attacks of diarrhœa and colic. Her pulse-rate, which had been regular and normal in rate on admission, rose steadily, and she died quietly. An electrocardiograph shortly before death showed that the high pulse-rate was due to auricular tachycardia. An X ray of the forearms and wrists taken shortly after admission showed slight general decalcification, but this was not very pronounced, and there was no evidence of active or healed rickets. On a diet containing 120 g. carbohydrate, 60 g. protein, and 45 g. fat, her output of fat and nitrogen in the stools was studied for a few days. The figures are given in Table II and show a low output of nitrogen and a high output of fat, of which only a small percentage was split.

TABLE II—ANALYSIS OF FÆCES FOR FATS AND NITROGEN FROM FEB. 2 TO 6, 1937

Period	Total nitrogen	Total fat	Split fat as percentage of total fat
2nd–3rd ..	1·6 g.	28 g.	21
3rd–4th ..	0·65 g.	7 g.	20
4th–5th ..	0·98 g.	27 g.	21
5th–6th ..	0·72 g.	13 g.	19
Average output per diem.	0·99 g.	19 g.	—

Average composition of stool over above period.
Dry matter = 44 per cent. of fæces.
Total fat = 50 per cent. of dry matter.
Split fat = 20 per cent. of total fat.

The most interesting feature in the laboratory examinations was the blood picture:—

Red cells ..	.. 3,110,000	Polymorphs ..	.. 30%
White cells ..	4,800	Lymphocytes	.. 62%
Hæmoglobin ..	47%	Monocytes ..	.. 3·5%
Colour-index ..	0·76	Eosinophils ..	.. 4·5%
Reticulocytes ..	0·35%		

There were 32 normoblasts, all with pyknotic nuclei, seen in the course of counting 200 white cells.

The stained smear showed a remarkable variation in the size of the cells from microcytes to megalocytes. The majority of the cells, including the megalocytes,

were poorly stained. Many of them were only stained around the periphery, the central zone being pale as in an iron deficiency anæmia. But the large size of many of the cells sharply differentiated the blood picture from that of the latter condition. There was very little poikilocytosis, punctate basophilia, or polychromatophilia, but platelets were plentiful. No primitive red cells were seen below the stage of mature normoblasts with pyknotic nuclei. The characters of the blood count were confirmed on several occasions. The absolute number of polymorphs was always low, and on one occasion the white cell count was only 2900. One-eighth of these cells were, however, probably normoblasts and the differential count gave only 30 per cent. polymorphs. The absolute polymorph count must therefore have been about 800 per c.mm. The Price-Jones curve is shown in fig. 1. It shows a mean diameter of 8·66 μ and 59 per cent. of megalocytes.

Pathological Findings

At post-mortem examination performed 12 hours after death the body showed gross emaciation and a striking absence of rigor mortis. The great toes were clubbed but there was no definite clubbing of the fingers. There was diffuse, fine, yellow-brown mottling of the skin on the face, trunk, and upper limbs. On opening the body the most obvious feature was the complete absence of fat. The heart weighed 7 oz. and showed definite brown atrophy. There was very little atheroma of the coronary arteries but the mitral valve barely admitted 2 fingers, and the margins of the cusps and the chordæ tendiniæ were thickened. The left auricle was enlarged, and the left ventricle hypertrophied. The lungs showed partial collapse, and a calcified scar at the right apex. The thyroid gland weighed 35 g. and contained a calcified nodule in the left lobe.

In the abdomen the absence of fat in the mesentery was most striking, but there were also numerous small, fleshy glands in the mesentery, probably the normal glands unmasked by the absence of fat. None of them was caseous or calcareous. There was no evidence of fibrosis or thickening of the lymphatics in the mesentery. Both stomach and duodenum were dilated, but otherwise macroscopically normal, except that there was a small ulcer, about ½ in. in diameter in the duodenum, situated some 1½ in. above the ampulla of Vater, but well below the usual area of peptic ulceration. Radiating from it was a circle of fibrosis which partially occluded the lumen of the duodenum. Below this the duodenum was dilated. Starting in the third part of the duodenum, and extending right down to the ileo-cæcal valve there were numerous annular strictures, many only 2 in. apart. For the most part these strictures were very narrow, dipping deep into the bowel lumen, so that in many places they formed membranous partitions, pierced by openings about ½ in. across. However, some were much broader, with obvious thickening of the peritoneal coat and fibrosis of the bowel wall. Between the strictures the bowel was sometimes dilated and thin, and sometimes hypertrophied. Except over the few broad strictures the peritoneal surface of the bowel was normal, and there were no adhesions between the coils. The large bowel was quite normal in appearance, with the exception of 8 in. of the descending colon, where it was thick and apparently contracted, but there were no signs of old ulceration.

The liver weighed 29 oz. and was pale and slightly fatty. The gall-bladder was distended with dark bile, and contained a single blackberry gall-stone. The kidneys weighed 2·5 oz. and were small and grossly contorted. The surface was slightly granular, but the capsule stripped easily, except for local attachments at the fibrotic zones. The cortex was not obviously diminished. The suprarenal glands weighed 7·25 g. and 5 g. and were macroscopically normal. The spleen weighed 18·25 g. and showed some small patches of perisplenitis with the pulp dark and rather friable. A wedge of bone was removed from the lower lumbar vertebræ. It showed well-defined spongy bone throughout, interspersed with pink marrow. The ribs were apparently normal, with pink marrow. The right femur contained considerable red marrow in the upper part, but the amount diminished through the middle third to almost completely fatty marrow in the lower third. The cortex of the bone was longitudinally streaked and not ivory in consistency. Spongy bone was fairly well distributed throughout the shaft, with the exception of the upper third.

MICROSCOPIC SECTIONS

Section of the duodenal ulcer showed scarring but no evidence of acute inflammation. The only signs of activity were a few mononuclear leucocytes around the blood-vessels, and young fibroblasts and scattered plasma cells. There was certainly no suggestion of tuberculosis. The mucous membrane of the small bowel was complete and with the exception of the broader strictures there was no increase in fibrous tissue. At the root of the mesentery there was considerable fibrosis and in the lymphoid tissue in the neighbourhood of the vessels were numerous bands of fibrous tissue, evidence of past inflammation. There was no evidence of tuberculosis. The sections of the large bowel bore out the assumption that the appearance was due to muscular spasm and not to any gross pathological change. In the other organs there was widespread atheroma of the medium-sized arteries but otherwise no abnormality. Sections of the bone-marrow showed megaloblastic hyperplasia indistinguishable from that found in Addisonian pernicious anæmia.

DISCUSSION

The blood picture in this case was very similar to that described by Bennett, Hunter, and Vaughan (1932) in two cases of idiopathic steatorrhœa. The number of erythroblasts was very much less than in their cases, but the patient had had fairly intensive treatment with both liver and iron. The number of erythroblasts in Case 6 of Bennett, Hunter, and Vaughan's series sank to about the same number as in the present patient after he had been treated. The appearance under the microscope of the blood of the present case is strikingly similar to that shown in their fig. 17B. The coexistence of megalocytosis and hypochromia in three patients who showed other evidence of malnutrition suggests a dual deficiency of iron and the pernicious anæmia factor. In the present instance there was no opportunity to observe the effects of treatment, but the patient's past record suggests that her response was very incomplete to either form of treatment. Bennett, Hunter, and Vaughan's two cases both responded well to iron, but the blood picture did not return to normal. It is noteworthy that the present patient had her best blood picture in May, 1936, after a prolonged course of iron therapy. The small amount of evidence available therefore suggests that this peculiar anæmia in adults is associated with multiple nutritional deficiency conditioned by a disorder of the alimentary tract, and that the deficiency of iron is the most important. The megalocytosis and hypochromia with a low reticulocyte count and the low absolute polymorph count all suggest a deficiency dyshæmopoietic anæmia. Bennett, Hunter, and Vaughan conclude that the blood picture in their two cases is "indistinguishable from that seen in erythroblastic anæmia." The latter condition, originally described by Cooley, is defined by Vaughan (1934) as a leuco-erythroblastic anæmia occurring usually in children of Mediterranean stock and associated with splenomegaly, mongoloid facies, and generalised changes in bones. When the hæmatological features of the two conditions are compared, however, there are

quite definite differences. In Cooley's anæmia leucocytosis is almost invariably present (Baty, Blackfan, and Diamond 1932, and Whipple and Bradford 1932) and polymorphs predominate. In the three adult cases the white cell count was low or normal and there was a tendency to reduction in the proportion of polymorphs. In Cooley's anæmia all types of primitive red cells are seen in the blood—megaloblasts, erythroblasts, and normoblasts—whereas the extraordinary feature of the three adult cases is the virtual absence of primitive red cells showing nuclear structure while normoblasts with pyknotic nuclei are present in such large numbers. The many clinical differences between the two conditions suggest that even the somewhat similar blood pictures may be due to quite different mechanisms. Whipple and Bradford (1932) suggest that Cooley's anæmia is due to "some fundamental change in the method of handling body pigment." Nittis and Spiliopulos (1937) have recently suggested that it is due to chronic infestation with the malarial parasite, but in spite of very similar blood pictures and bone changes the account of Nittis and Spiliopulos does not convince one that they are describing a clinical syndrome identical with that described by Cooley.

Intestinal Absorption in Stricture Anæmia

Hawksley and Meulengracht express the view that stricture anæmia is dependent upon two factors, the relative importance of which varies from case to case. The two factors are absence of gastric secretion and reduced power of intestinal absorption. That the factor of intestinal absorption may be important is shown in a case described by Schlesinger (1933) in which Castle's intrinsic factor was demonstrated in the gastric juice. A case is here recorded of a patient with megalocytic anæmia in whom deficient intestinal absorption appeared to be the main ætiological factor.

CASE 2.—A single man of 32 was admitted to Addenbrooke's Hospital under the care of Prof. Ryle in 1937. Eleven years previously he had been admitted as a case of acute appendicitis with intestinal obstruction following nine days' history of vomiting and severe colicky abdominal pain. At operation adhesions were found around an inflamed appendix, which were completely obstructing a loop of small intestine. The adhesions were divided and the appendix removed, and the patient was discharged after two weeks. A few weeks later he was readmitted with intestinal obstruction. At operation free fluid was found and the intestines were noted to be matted together by numerous plastic adhesions. He was regarded as a case of tuberculous peritonitis and handed over to the county tuberculosis officer. After three years' open-air treatment, during which there were many episodes of partial intestinal obstruction, and a year in Switzerland, he returned to work apparently cured. For two years he remained in fairly good health and quite free from abdominal symptoms. Then after three months of attacks of diarrhœa accompanied by increasing lassitude and pallor he was readmitted and found to have the blood count of pernicious anæmia: red blood cells, 708,000; hæmoglobin, 22 per cent.; colour-index, 1·57; white blood-cells, 3400. A test-meal was not performed. He was treated with injections of liver extract and made a good recovery. Shortly before discharge he had 5,050,000 red blood-cells; hæmoglobin, 62 per cent.; and colour-index, 0·61. Iron therapy was therefore added. Since his discharge in 1932 he had had only very occasional treatment with liver, but had remained in fairly good health. There had been, however, recurrent attacks of colicky abdominal pain with diarrhœa. In 1937 he had a very severe attack of abdominal pain and diarrhœa and following this was admitted to hospital again.

He was obviously anæmic. The tongue was rather too clean, but showed both types of papillæ. The abdominal wall was very lax from previous operation scars, but there was no tenderness and nothing abnormal was palpated. No blood was found in the stools and no tubercle bacilli. X ray examination showed that the opaque meal reached the cæcum in 4½ hours, but there was much pocketing and distortion of the normal outline, presumably by adhesions. At this time his blood count was: red blood-cells, 1,470,000; hæmoglobin, 48 per cent.;

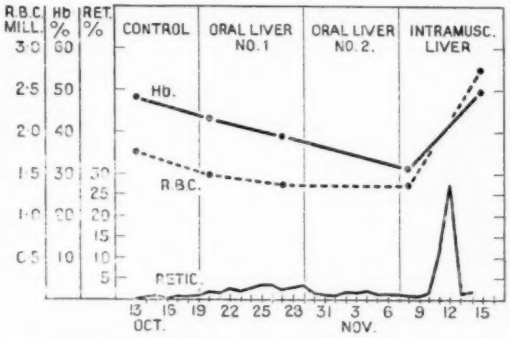

FIG. 2 (Case 2)—Response of the blood to treatment by oral and by intramuscular liver.

colour-index, 1·37; white blood-cells, 2880. The stained film was typical of pernicious anæmia. A test-meal showed the presence of free hydrochloric acid in moderate quantity. It was impossible to determine whether Castle's factor was present in the gastric juice because no other patient was available at that time with pernicious anæmia. In view of the history and the presence of free acid it was suspected that the anæmia was due to faulty intestinal absorption. The data given in fig. 2 strongly suggest that this was so. There was no response of the reticulocytes or blood to two preparations of liver extract given by mouth. The second of these preparations was equivalent to ½ lb. of ox liver per day and was a preparation which had repeatedly been proved effective in pernicious anæmia. In the next trial period a preparation from the same manufacturers, representing 20 g. of ox liver was injected daily. There was an excellent reticulocyte response and a rapid improvement in the blood. Two months after discharge the blood count was: red blood-cells, 5,140,000; hæmoglobin, 100 per cent.; colour-index, 0·97; white blood-cells, 4220; and the patient was in excellent health.

The presence of free hydrochloric acid in the gastric juice suggests that had an assessment been possible Castle's factor might have been found present as in Schlesinger's case. Even in the absence of this information, however, the fact that there was no response to liver by mouth with preparations of proved value, and a rapid response following injection, suggests that in this case the anæmia was due to faulty absorption rather than to deficient gastric secretion.

Causes of Intestinal Stricture

The cause of intestinal stricture is of interest. Meulengracht, in reviewing the condition, followed Gluzinski in regarding them as resulting from a primary tuberculous infection with strong healing tendencies. There can be little doubt that the tubercle bacillus is the cause in some cases, but there may be other causes. Two cases may be briefly referred to in this connexion.

A carpenter of 46 who had previously seen extensive service in the army in India and Malaya was admitted to Addenbrooke's Hospital in 1934. About a year

previously he had been seen in the out-patient department for malaise and lower abdominal pain following the removal of teeth. He improved considerably on a careful diet and alkaline powders, but early in 1934 he lost weight and looked so ill that his doctor referred him to the hospital as a possible case of carcinoma of stomach. Soon after admission and before he had been fully investigated he had hæmaturia and vomited blood, and went downhill rapidly. At autopsy there was no ulcer of the stomach or duodenum, but there was blood throughout the jejunum and ileum. The jejunum, but not the ileum, showed numerous transverse ulcers which practically encircled the lumen, and were from ¼–½ in. wide. The ulcerated areas were shallow but reached down to the circular muscle layer, and their histology showed nothing specific. Colonel Whitmore, who had had extensive experience as a pathologist in Singapore, recognised the condition as similar to a banded ulceration of the small intestine which is not uncommonly encountered at autopsy in that part of the world; the ætiology is unknown, and he repeatedly failed to find evidence of tuberculosis. The multiple intestinal strictures described in the first patient recorded in this paper might quite easily have developed from a similar condition of transverse intestinal ulceration.

I am indebted to Prof. McNee and Mr. E. K. Martin for details of a woman attended by them for a condition suggesting sprue which developed after residence for many years in China and culminated in an attack of acute intestinal obstruction. At operation a constriction was found in the lower part of the small intestine. The anti-mesenteric border of the constriction showed a wide patch of thickened peritoneum, suggesting a healed ulcer. A lateral anastomosis led to complete cure. Barbour and Stokes (1936) have recently reported a case of chronic stenosing enteritis in a patient who had lived in China. They class it with Crohn's disease and express the view that Crohn's disease is a secondary non-specific granuloma developing in an intestine which may have been injured by any one of a wide variety of agents. It is apparent that there are still gaps in our knowledge of the pathology of the small intestine. In the first patient recorded in this paper there was so little to suggest tuberculous peritonitis that the ætiology of the strictures should be left unsettled.

There is one further point of considerable interest about the first patient. She had been regarded for years by several physicians as a case of idiopathic steatorrhœa. The history of diarrhœa going back into childhood, and the finding of fatty stools, anæmia, and a pellagrous state made this diagnosis very probable. The late Th. E. Hess Thaysen (1935) stipulated four diagnostic criteria of idiopathic steatorrhœa: (1) An abnormally large quantity of fat excreted in the fæces; (2) normal or only slightly increased excretion of nitrogen; (3) flat blood-sugar curve; (4) raised metabolic rate.

Although this patient was clinically so suggestive of idiopathic steatorrhœa she by no means fulfilled these criteria. Neither the glucose tolerance nor the basal metabolic rate had been measured. The stool fat was only slightly above the upper limit of normality when it was first estimated, and though it was higher shortly before death the proportion of split fat had then been reversed to what is usually regarded as typical of pancreatic steatorrhœa. The nitrogen excretion was, however, still suggestive of idiopathic steatorrhœa rather than pancreatic steatorrhœa. It is usual in idiopathic steatorrhœa or adult cœliac disease to find at autopsy no pathognomonic intestinal lesion, but Fairley and Mackie (1937) have recently drawn attention to the appearance of a sprue-like abdomen in a number of conditions in which the mesenteric lymph nodes are enlarged. In the cases described by them and in patients with tabes mesenterica previously described by Ryle lacteal obstruction seems to be important. In gastro-colic fistula absorption is interfered with because the food is short-circuited from the small intestine. In adult cœliac disease and in tropical sprue the defect of absorption is so far unexplained and it is not associated with any demonstrable lesion. In the first case recorded here a very definite intestinal lesion was found, but the mechanism by which it interfered with absorption is not clear.

Summary

1. A case is described, in detail, of an elderly woman who had suffered throughout her life from a sprue-like syndrome, and in whom autopsy revealed multiple intestinal stenoses.

2. Another case is recorded in which, following tuberculous enteritis, megalocytic anæmia developed, which responded readily to injection of liver extract, although there was no response to liver extract by mouth.

3. The ætiology of multiple intestinal stenoses is briefly discussed.

I am indebted to Prof. J. A. Ryle, Dr. Leslie Cole, Prof. J. M. McNee, and Mr. E. K. Martin for permission to quote from their notes on the cases recorded, and to Lieut.-Colonel A. Whitmore for his opinion on some of the sections and for permission to quote his opinion about "banded" ulceration of the small intestine as seen in Malaya.

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THE CASE FOR PROPHYLAXIS WITH SULPHANILAMIDE AND M. & B. 693

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Levaditi and Vaisman (1936) reported that mice treated with a single dose of the hydrochloride of 4′sulphamido-2 : 4-diaminoazobenzol (Prontosil rubrum) were resistant, up to twenty-three days afterwards, to a subsequent intraperitoneal infection with hæmolytic streptococci. As a result of the protection afforded to mice by a single dose before infection, followed by several doses after infection, and from investigations on the bactericidal power of the blood of normal human beings, Colebrook (1937) advocated the use of sulphanilamide as a prophylactic measure, in certain circumstances, against hæmolytic streptococcal infection in the puerperium. Colebrook later considered that his experiments on mice had not been quite conclusive, being open to the objection that equally good results

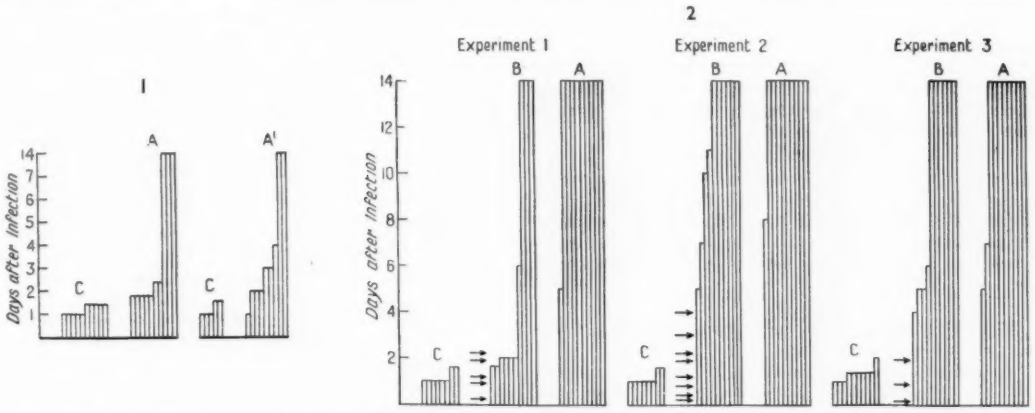

FIG. 1—Sulphanilamide. Single dose before infection. A = 10 mg. subcutaneously 3 hours before infection. A′ = 30 mg. subcutaneously 24 hours before infection. C = Control (no sulphanilamide). Infection = 100 M.L.D. hæmolytic streptococci into the peritoneum. In all the figures each column represents one mouse.

FIG. 2—Sulphanilamide. Single dose (10 mg.) before and multiple doses after infection. A = single dose 2–3 hours before; multiple doses after infection at 6, 22, 30, 46, and 54 hours (Experiment 1); at 6, 11, 21, 30, 46, 54, 70, and 96 hours (Experiment 2); and at 5, 22, and 46 hours (Experiment 3). B = multiple doses after infection (time intervals as in A). C = control (no sulphanilamide).→Sulphanilamide 10 mg. In this figure and in fig. 3 *infection* = 1000 M.L.D. hæmolytic streptococci into peritoneum.

might have been obtained had the initial prophylactic dose of sulphanilamide been omitted.

The following experiments were planned to remove this objection and to investigate more fully the possible use of sulphanilamide, certain diazo compounds, benzylaminobenzenesulphonamide (Proseptasine), and 2-(*p*-aminobenzenesulphonamido) pyridine (M. & B. 693) for the purposes of prophylaxis.

Prophylactic Experiments on Animals

Mice were used and were infected intraperitoneally. The two strains of hæmolytic streptococci (Lancefield's Group A) used had been isolated from infected patients and had been rendered highly virulent for mice by repeated mouse-passage. Strain Richards had received 44 passages, and Strain Robb 10. Except where otherwise stated the drug was injected subcutaneously into the back of the neck.

SULPHANILAMIDE

Sulphanilamide was given as a 2 per cent. solution in saline. The drug went completely into solution when warmed to about 40° C. and was given at this temperature.

Single dose before infection.—Using 100 M.L.D. (minimum lethal dose) of streptococcus culture, a single dose of 10 mg. given 3 hours before infection only delayed the time of death of seven of the ten mice used from 24 to between 44 and 51 hours; the remaining three were alive and well 14 days after infection (fig. 1). When a single dose of 30 mg. was used, all the mice were extremely ill within 3 hours. There was incoördination of the limbs with difficulty in walking; the limbs were extended in spasm with the feet flexed; respirations were rapid; two of the mice were lying on their sides with their bodies flexed in spasm. Six hours later all had recovered and appeared normal. Only a partial protection was afforded to a subsequent hæmolytic streptococcal infection. From these experiments it was obvious that more than one dose of sulphanilamide would have to be given to produce a satisfactory protection.

Single dose before and multiple doses after infection.—Further experiments were made in which the following procedure was adopted (fig. 2).

Series A received 10 mg. 2–3 hours before and again after infection at 6, 22, 30, 46, and 54 hours (Experiment 1); at 6, 11, 21, 30, 46, 54, 70, and 96 hours (Experiment 2); and at 5, 22, and 46 hours (Experiment 3).

Series B received sulphanilamide after infection only.

Series C received no sulphanilamide.

More mice survived in Series A, which had sulphanilamide before infection, than in Series B, although the difference between the two groups was never very obvious.

In another experiment (fig. 3) the infection was allowed to progress for 17 hours before further treatment with sulphanilamide was given, and in this instance nearly all in Series A survived, whereas nearly all in Series B died. The failure of sulphanilamide to cure the mice in Series B was due to the length of time that the infection was allowed to progress (17 hours) before any treatment was given.

DIAZO COMPOUNDS

The first drug tested was prontosil rubrum substance supplied by Messrs. Bayer. A subcutaneous injection of 50 mg. in suspension in saline was given to four mice. From the second day onwards there was suppression of urine, and on the sixth day three of the mice were dead. The deaths were not due to infection, and no cause was found, but it was assumed that the drug was responsible. Another German preparation of prontosil rubrum, suspended in oil, was tested, but this preparation also was found to be toxic to mice, although none of them died.

A third drug, Carboxy prontosil, prepared by Dr. Girard, was injected as a suspension in a 4 per cent. solution of gum saline. This drug afforded some protection against a subsequent hæmolytic streptococcal infection, but of five uninfected mice which received the carboxy prontosil alone two died during the third week after injection. Of another series

of four mice which received 50 mg. of the drug alone two died. No evidence of infection was found in these mice.

In view of the toxicity to mice of these red prontosil preparations when given subcutaneously in a suspension, further work on their protective properties was not undertaken.

PROSEPTASINE

Proseptasine was injected subcutaneously as a suspension in a 4 per cent. solution of gum saline. A dose of 25 mg. was given 3 hours before the infection by hæmolytic streptococci. The drug afforded some protection, but this was not of a very high order (fig. 4).

M. & B. 693

M. & B. 693 was given as a suspension in a 4 per cent. solution of gum saline.

Subcutaneous administration.—When the interval between the prophylactic dose of the drug and the infection was 3 hours, 30 mg. of the drug afforded complete protection; 20 mg. enabled nine out of ten mice to be saved; and 10 mg. delayed the death of four of the mice until the sixth day and saved the remaining six. A dose of 20 mg. of the drug in an oily suspension prepared by Messrs. May and Baker afforded complete protection to a series of 10 mice tested (fig. 5).

A further series of experiments was made in which the interval between the infection and the protective dose of the drug was lengthened (fig. 6). Using a constant dose of 20 mg., when the interval was prolonged to 24 hours almost complete protection was afforded, whereas with a 48-hour interval there was a satisfactory but less complete protection.

Oral administration.—A single dose of 20 mg. given by stomach-tube produced some protection when the interval before infection was 3 hours, but no protection when the interval was prolonged to 24 hours (fig. 7).

A further experiment was made in which multiple doses were given after infection (fig. 8).

Series A received 10 mg. of M. & B. 693 into the stomach 3 hours before infection, and again after infection at 16, 24, 40, and 64 hours.

Series B received the drug after infection only.

Series C received no drug.

TABLE I—RESULTS OF BACTERICIDAL TESTS ON BLOOD OF PATIENTS TREATED WITH SULPHANILAMIDE

Case	—	Cocci implanted in 200 c.mm. of blood	Cocci surviving after 24 hours in 200 c.mm. of blood		Concentration of free sulph. in patient's blood
			Control	Patient	
1	Before sulph.	5	18×10^6	1×10^6	—
		50	18×10^6	18×10^6	—
	2nd day of treatment—				
	3 hrs. after sulph. . . .	2,150	15×10^6	0	1 in 70,000
	(total received 2 g.)	10,750*	15×10^6	0	
2	Before sulph.	25	54×10^6	$1{\cdot}5 \times 10^6$	—
		120	54×10^6	$4{\cdot}2 \times 10^6$	—
	2nd day of treatment—				
	1 hr. after sulph. . . .	570	23×10^6	0	1 in 70,000
	(total received 2 g.)	2,850	25×10^6	0	
3	Before sulph.	200	39×10^6	6×10^6	—
	1 hr. after sulph. . . .	5,000*	37×10^6	0	Less than 1 in 100,000
	(total received 1 g.)				
4	Before sulph.	40	$11 \times 10_6$	12×10^6	—
	2nd day of treatment—				
	15 hrs. after sulph. . . .	325	$27 \times 10_6$	0	1 in 74,000
	(total received 3 g.)	1,625*	27×10^6	0	
5	Before sulph.	10	$16 \times 10_6$	10×10^6	—
	1 hr. after sulph. . . .	175	18×10^6	0	1 in 75,000
	(total received 1 g.)	875*	24×10^6	0	
6	Before sulph.	10	$15 \times 10_6$	$9{\cdot}6 \times 10^6$	—
	3rd day of treatment—				
	3 hrs. after sulph. . . .	200	$21 \times 10_6$	0	1 in 40,000
	(total received 7 g.)	1,000*	$24 \times 10_6$	0	

Dosage.—Cases 1 and 2, 0·5 g. three times daily.
Cases 3–6, 1·0 g. " "

* Maximal implant used. Sulph. = sulphanilamide.

All the mice survived in Series A, whereas less than half survived in Series B, which received no treatment until the infection had progressed for 17 hours.

The greater protection afforded by a single dose of M. & B. 693, when the drug is given subcutaneously and not by the stomach, is probably due to the slower absorption from the subcutaneous tissues, which maintains a small but sufficient concentration of the drug in the blood for a long time. The increased solubility of M. & B. 693 in acid (solubility in N/50 HCl being 0·14 per cent., and in saline 0·05 per cent.)

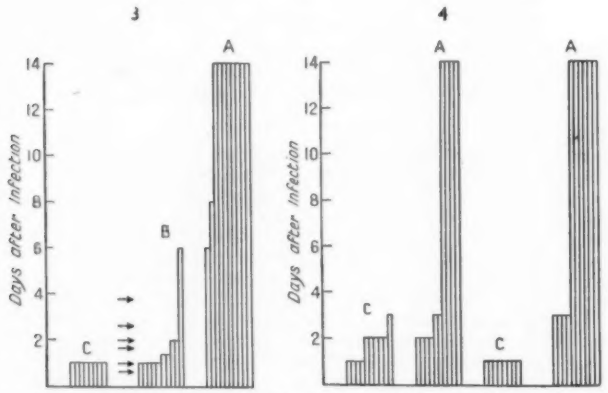

FIG. 3—Sulphanilamide. Single dose (10 mg.) before and multiple doses after infection. A = single dose 3 hours before; multiple doses after infection at 17, 24, 41, 49, 65, and 89 hours. B = multiple doses after infection (time intervals as in A). C = control (no sulphanilamide).→Sulphanilamide 10 mg.

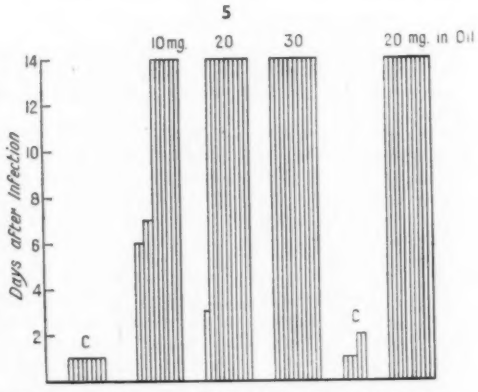

FIG. 4—Proseptasine. Single dose 3 hours before infection. A = 25 mg. subcutaneously. C = control (no drug). In this figure, and in all those following *infection* = 100 M.L.D. hæmolytic streptococci into peritoneum.

FIG. 5—M. & B. 693. Single dose subcutaneously. 10, 20, 30 = dose in mg. 3 hours before infection. C = control (no drug).

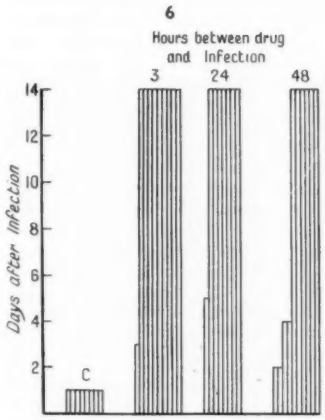

FIG. 6—M. & B. 693. Single dose subcutaneously. 3, 24, 48 = interval in hours between single dose of 20 mg. and infection. C = control (no drug).

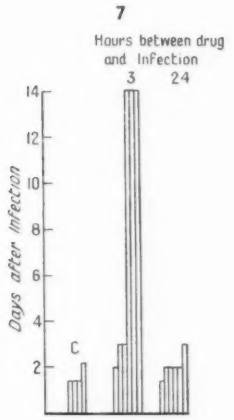

FIG. 7—M. & B. 693. Single dose into the stomach. 3, 24 = interval in hours between single dose of 20 mg. and infection. C = control (no drug).

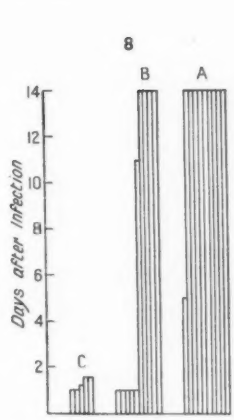

FIG. 8—M. & B. 693. Multiple doses into the stomach. A = single dose 10 mg. 3 hours before; multiple doses after infection at 16, 24, 40, and 64 hours. B = multiple doses after infection (time intervals as in A). C = control (no drug).

is almost certainly a factor in the more rapid absorption from the gut.

The excellent protection afforded by a single subcutaneous dose of M. & B. 693 is in conspicuous contrast to the absence of any protection from a similar dose of sulphanilamide. The solubility of M. & B. 693 in saline at 24° C. is 0·05 per cent. and in serum at 37° C. 0·08 per cent., whereas for sulphanilamide the corresponding figures are 0·74 per cent. and 1·1 per cent. The fact that sulphanilamide is about fifteen times as soluble as M. & B. 693 accounts for the absence of any protection from a single subcutaneous dose of the former drug, since it is too rapidly absorbed and excreted to produce any prolonged effect.

Bactericidal Power Induced by Sulphanilamide and M. & B. 693

The rotating-tube method previously described in detail (Hoare 1938) was used for estimating the bactericidal power of the blood.

Sulphanilamide.—The results with sulphanilamide are shown in detail in table I. Cases 1 and 2 received 0·5 g. of sulphanilamide three times daily, and the remainder 1 g. three times daily. All 6 patients developed a high bactericidal power in their blood. Cases 1–5 were tested 1 hour after the first dose of sulphanilamide, and in Cases 3 and 5 a bactericidal power was found to be present at this time. The other 3 patients had a bactericidal power in their blood when next a test was done 24 hours later.

M. & B. 693.—The results with M. & B. 693 are shown in table II. The patients received 1·5 g. of the drug three times daily, and tests were made on their blood during the puerperium (each patient had a normal puerperium). Blood from Cases 1 and 3 killed a small number of cocci before treatment, but this killing-power was much increased after the administration of the drug. All three patients developed a high bactericidal power in their blood, and in each instance the largest implant of cocci was completely killed after 24 hours' incubation. Those tubes in which no viable cocci were present after 24 hours' incubation were still sterile after a further 48 hours.

TABLE II—RESULTS OF BACTERICIDAL TESTS ON BLOOD OF PATIENTS TREATED WITH M. & B. 693

Case	—	Cocci implanted in 200 c.mm. of blood	Cocci surviving after 24 hours in 200 c.mm. of blood		Concentration of M. & B. 693 in patient's blood
			Control	Patient	
1	Before treatment ..	130	Inf.	0	—
		650	Inf.	Inf.	—
	3rd day of treatment— Total received 10·5 g.	600	Inf.	0	Not estd.
		3,000	Inf.	0	Not estd.
2	Before treatment ..	28	Inf.	Inf.	—
	2nd day of treatment— Total received 6 g...	3,600	Inf.	0	1 in 25,000
		18,000	Inf.	0	"
3	Before treatment ..	200	Inf.	0	—
		1,000	Inf.	Inf.	—
	2nd day of treatment— Total received 4·5 g.	42,500	Inf.	0	1 in 36,000
		340,000	Inf.	0	"

Dosage.—1·5 g. M. & B. 693 three times daily.
Inf. = infinitely large. Not estd. = not estimated.

Discussion

Child-birth often takes place in circumstances which involve special risk of infection by hæmolytic streptococci. More and more these dangerous circumstances will come to be recognised by those engaged in maternity work, and it is important therefore to consider whether the mothers exposed to such special risk can be rendered immune for the period of labour and the next few days by the administration of a chemotherapeutic agent. The mouse experiments here reported certainly suggest that this could be done; and the suggestion finds further support from the demonstration of a greatly increased bactericidal power in the blood of the parturient women so treated.

The ideal plan of preventive immunisation by means of a single safe dose given at the beginning

of labour or even before labour is not yet in sight. Since a single dose of 20 mg. of M. & B. 693 given subcutaneously to mice weighing about 20 g. produced protection against subsequent infection up to 48 hours, the corresponding dose for a human being of 70 kg. would be 70 g. A half or even a third of this dose given subcutaneously would be far too large to be practicable even if it were safe. There is good reason to hope, however, that a series of oral doses of sulphanilamide or of M. & B. 693, given twice or thrice daily for three or four days from the beginning of labour, would at least afford some degree of protection during that period. It would almost certainly not last for more than about 12 hours after the last dose.

It is hardly possible to adduce positive evidence that such immunity is conferred on human beings. A large-scale trial of the method in the routine practice of a maternity hospital (apart from the circumstances of special risk referred to above) would be scarcely feasible. Well-organised maternity units today have an incidence of hæmolytic streptococcal infections (Group A) not greater than 1 in 500, and it would be necessary to give prophylactic treatment to not less than 20,000 women and to observe a similar number of untreated patients to obtain statistical data of any probative value.

On the other hand, failure to afford protection to women delivered in dangerous circumstances may show that our hopes of this prophylactic method are not justified. If that should be so, the treatment may still be of considerable value, since it will almost certainly prevent the rapid development of a localised infection into the much more dangerous infection of the peritoneal cavity or of the large veins draining the genital tract.

The object of the present paper is to record the experimental data which appear to justify clinical trial of this prophylactic procedure. The circumstances of special risk in maternity work which call for its use have been sufficiently dealt with by Colebrook (1937) and Colebrook and Kenny (1936), who also pointed out the undesirability of indiscriminate administration of these drugs apart from special circumstances. I would here only add the suggestion that a similar prophylactic procedure might sometimes also find a useful place in surgery—e.g., in association with tonsillectomy in a patient known to be a carrier of hæmolytic streptococci and possibly to avert a dangerous extension of the infection when operating on the mastoid or other acutely infected tissues.

In conclusion it may be urged that the possibility of prophylactic immunisation in obstetric practice does not in the least warrant any abandonment of antiseptic or aseptic technique in the conduct of labour. In my last paper (Hoare 1938) reference was made to two strains of hæmolytic streptococci (Group A) which were resistant to sulphanilamide; one of these might start an epidemic. We cannot afford to give anything away in the struggle against the hæmolytic streptococcus.

Summary

(1) Mice can be protected against an infection by hæmolytic streptococci (100–1000 M.L.D. intraperitoneally) by the subcutaneous injection of a single dose of M. &. B. 693 within the previous forty-eight hours. With sulphanilamide, owing to its greater solubility, a single subcutaneous prophylactic injection has but little effect, but good protection is obtained if, in addition to the prophylactic dose, the drug is given twice daily for three days after the infection by hæmolytic streptococci. Repeated administration is necessary after infection if M. & B. 693 is given into the stomach.

(2) A high bactericidal power was demonstrated in the blood of uninfected patients during the puerperium, three under treatment with M. & B. 693 and six with sulphanilamide.

(3) In view of the animal experiments and the bactericidal tests on the blood of women under treatment by M. & B. 693 and sulphanilamide the use of these drugs is suggested as a protective measure in maternity cases (and sometimes also in surgical cases) where there is believed to be special risk of infection by hæmolytic streptococci.

(4) The suggested dosage is 1 g. of sulphanilamide or of M. & B. 693 thrice daily, beginning as soon as labour starts and continuing for three or four days.

My thanks are due to Dr. L. Colebrook for his continued interest and advice in this work and to Dr. A. T. Fuller for his estimations of sulphanilamide and M. & B. 693 in the blood. I acknowledge with thanks the supply of M. & B. 693 from Messrs. May and Baker Ltd., the prontosil rubrum substance from Bayer Products Ltd., and the carboxy prontosil from the Roussel Laboratories Ltd.

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DERMATOMYOSITIS

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A GIRL of 18 came to the out-patient department of Aberdeen Royal Infirmary in February, 1937, complaining of swelling of the hands and feet, and scaliness of the face and head. These symptoms had been present since November, 1936, and began as a roughness or chapping of the hands. This was followed by itching in the back of the neck and the flexor aspects of the elbows and knees.

She had been previously healthy and had no rheumatic ailments or skin trouble, but in February, 1937, it was noted that her hands and feet were swollen and that her skin was œdematous, rough, red, and scaly in parts. Raised, œdematous, reddened patches were present in the flexures of the knees and elbows. The skin felt hard and the œdema was almost solid. There was no definite fixation of the skin to the underlying tissues and no muscular weakness was present. The patient was a photographer's assistant, and patch tests were made with the substances handled in her work. Metol gave a mild positive reaction, hydroquinone gave a definite positive reaction, but a mixture of metol and hydroquinone gave a negative result. The only other abnormality noted was a little bronchitis. At this time the condition, being suggestive of photographers' dermatitis, was considered to be occupational. The treatment given was an application of anhydrous lanolin before and after work. Although the patient continued working the condition rapidly improved and by the end of March the parts appeared practically normal.

A month later she began to feel tired and breathless and noticed that she was becoming gradually stiff. In August, 1937, she was so weak that she was unable to dress herself, and she also complained of stiffness of the shoulders and elbows and difficulty in swallowing and with speech. At this time (September, 1937) the skin had a violet-blue tint. Her general condition was poor and she was hardly able to hold up her head or extend her neck. She had to be propped up in bed, with the head supported. The myasthenia was general and severe.

The patient's tongue was clean and her tonsils healthy, but the throat was injected, and there was a mucopurulent discharge in the back of the throat. Speech was dysphonic and feeble like a whisper, and the palatal reflexes were poor. The pupils were sometimes dilated and sometimes contracted, but reacted normally to light and on accommodation. There were nystagmoid jerkings present. No facial paralysis, anæsthesia, or ear trouble was made out. The neck was very thin and the muscles were soft and wasted. The shoulder muscles were extremely small and the biceps and triceps of both arms were small and weak, except the right biceps which was swollen, soft, and tender. The forearms were small and wasted, and the grip was very weak, but the

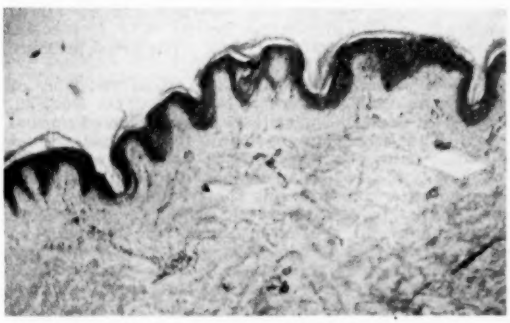

FIG. 1—Skin showing infiltration. (×65.)

supinator jerks were present. The legs were weak but showed no obvious wasting. The knee-jerks were diminished, sometimes absent, and the plantars were flexor. There was no definite pain in the wasted muscles, but the swellings were tender. No sensory changes were made out. The heart, lungs, and abdomen were normal.

SPECIAL INVESTIGATIONS

Blood picture.—Red blood-cells, 4,750,000; white cells, 10,600; hæmoglobin, 77 per cent.; colour-index, 0·9. Repeated throat swabs showed streptococci and staphylococci, but nothing else abnormal. The cerebrospinal fluid showed no cells and no globulin. The colloidal gold curve was normal and the Wassermann reaction negative.

Electrical reactions: None of the muscles of the shoulders, neck, and arms showed any reaction of degeneration. Throughout the affected areas the amount of current required to stimulate the muscles was considerable. At this time Dr. D. Levack noted that there was a remarkable loss of power to strong stimulus. No particular group of muscles seemed to be more affected than another and nothing abnormal was found in a radiogram of the spinal column.

By the end of September, 1937, the patient was comfortable, but still had weakness of the arms with some dyspnœa and dysphagia. The muscles were still wasted, but less so than previously. Towards the middle of November she was able to sit up in bed

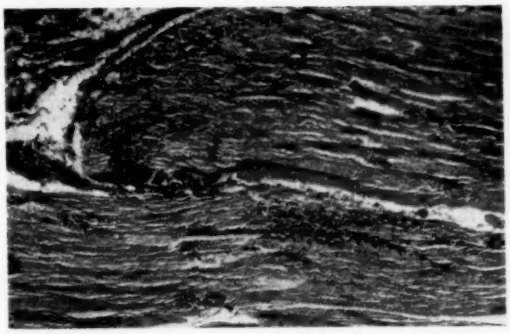

FIG. 2—Muscle showing infiltration and degeneration of fibres. (×65.)

without support. In January, 1938, it was noted that the muscles remained small, although she was able to walk quite well. She felt better, but her voice was still nasal in character and there was some difficulty in swallowing. In February, 1938, the skin of the hands, especially of the dorsum and fingers, was a violaceous pink and also somewhat shiny and atrophic. The finger-joints were stiff and the grip was weak, especially in the left hand. Both knees showed a macular erythematous rash and the scalp was dry and scaly. The patient looked weak and the conjunctivæ were pale. The throat was injected. The muscles were hard but small, and one or two nodes were palpable in the deltoids. The skin over this area seemed to be fixed.

A biopsy of muscle and skin was performed, and a report by Prof. J. S. Young states:—

The interstitial tissue of the muscle is extensively infiltrated by mononuclear cells in relatively large foci, comprising a small portion of plasma cells. The adjacent muscle-fibres are more or less atrophic, and some proliferation of the sarcolemmic nuclei is observed. The changes in the skin and fat are trivial, being characterised by a scanty round cell perivascular infiltration. From a histological point of view, the muscular changes are much more striking than the skin changes (see figs. 1–3).

Apart from massage and ephedrine, treatment did not seem to do much good, but she certainly felt stronger after being given elixir ephedrine, which

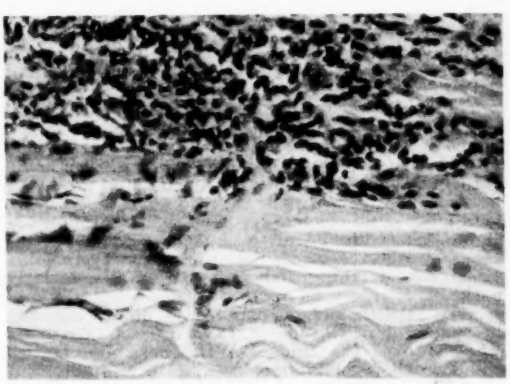

FIG. 3—Muscle under higher power, showing œdema and intensity of infiltration. (×120.)

she had for a long time. Prostigmin made no difference to the condition. It is considered that this case of dermatomyositis should be recorded partly because of its rarity and also because the weakness and wasting of the muscles did not take place for a considerable time after the early skin condition. The photomicrographs show the pathological changes as they affect the muscles, skin, and vessels. There was one bout of pyrexia during the illness, but this may be ascribed to nasal sepsis. We are unable to suggest an ætiology.

ACUTE DERMATOMYOSITIS

ASSOCIATED WITH RETICULO-ENDOTHELIOSIS

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With a Note on Histological Findings by

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DERMATOMYOSITIS is as mysterious as it is rare. It happens that during the past two years five cases have come under observation at the Royal Hospital, Wolverhampton. Three of these have been fatal: in one an autopsy was refused, in another the post-mortem appearances were confused by a terminal agranulocytosis of amidopyrine origin, and in the case reported here the changes were sufficiently remarkable to justify a full description. The matter must be left at this stage for the present, since our knowledge of dermatomyositis is too scanty to allow of an opinion whether the association with a reticulo-endotheliosis is an integral factor or not.

CLINICAL REPORT

The patient was a male aged 17, the youngest of eight living children. There was no consanguinity in the parents. His previous illnesses had been measles, chicken-pox, and whooping-cough in childhood. He was quite healthy until the beginning of September, 1937, when he complained of aching in the shoulders, followed by stiffness of the neck and aching in the thighs. For about three weeks he was able to remain at work, but he then consulted his doctor, who in the absence of any objective signs diagnosed rheumatism. On the morrow he went to work but was forced to return home, the pain being so severe as to make him cry. He made a gallant attempt to "work it off," but the pain proved too much, and he was forced to remain at home. A fortnight after this his voice became thick, and enlarged glands were found in the axillæ. By October, 1937, he noticed that he was becoming weaker; he could neither walk nor lift his arms properly, and gradually his back became so weak that he could not sit up. Soon afterwards œdema appeared, at first round the elbows, whence it spread to the legs and feet, throat, face, and eyes. After its first appearance the œdema varied considerably from day to day, particularly in the face, where on some days the eyelids would be very swollen and on other days not at all. At the beginning of November, 1937, a patch of redness appeared over the bridge of the nose and thence spread to the eyelids and cheek. He was admitted to hospital on Nov. 20.

Condition on admission.—The general colour was pale, but over the bridge of the nose, both eyelids, and the upper parts of the cheeks there was a swollen area covered with a bright red erythema. His appearance was that of a patient with nephritis and erysipelas. There was extensive œdema of the body, worst on the feet but also affecting legs, arms, and hands. There was extreme salivation, which lasted throughout the illness. There was an ulcerated patch on the right tonsil but no enlargement of the lymphatic glands at the angle of the jaw. Swallowing was extremely painful and remained so after the throat infection had subsided. So far as could be ascertained through the overlying œdema, the muscles were not wasted, but they were extremely weak. When lying in bed he could not raise his head, could not raise his arms above the horizontal, and could not bend his knees to more than a height of 4 in. above the bed. Not only could he not sit up, but it took two nurses to retain him in that position after he had been raised to it. The muscles were not tender on pressure.

The optic discs and retinæ were normal. Deep reflexes in arms and legs could not be obtained. The plantar reflexes were flexor. Sensation was normal. The face was distinctly expressionless and very reminiscent of the parkinsonian facies. This feature is presumably due to the muscular weakness and has been noted by other observers (Marcus and Weinstein 1935). A few small lymph glands were palpable in the posterior triangles of the neck and in both axillæ, and the heart was slightly enlarged, the apex-beat reaching to the nipple-line in the fifth intercostal space. The sounds were normal. The blood pressure was 140/90 mm. Hg.

Special examinations.—The electrical reaction of the muscles was tested on two occasions. On Nov. 30, 1937, "all muscles showed a weak reaction of normal type. The sensation of pain to an interrupted galvanic current appeared to be accentuated." On Feb. 24, 1938, "reactions to galvanism and faradism were present, but the response was invariably weak. In certain muscle groups, such as those of the back and the extensors of the forearm, the electrical reaction was lost altogether."

Radiography of the chest on Nov. 26, 1937, and on Feb. 24, 1938, confirmed the clinical enlargement of the heart. The mediastinum was normal. An electrocardiogram showed a normal complex in all three leads. No tubercle bacilli were found in the sputum. The Wassermann reaction was negative in both blood and cerebrospinal fluid. Fæces were normal, except for the presence of occult blood. A throat swab on admission to hospital gave a profuse growth of hæmolytic streptococci, but later swabs were normal. The blood calcium was 11 mg. per 100 c.cm. A biopsy of a lymph gland on Dec. 1, 1937, showed no abnormal features. The cerebrospinal fluid was normal in all respects. The urine was normal. The blood-urea was 62 mg. per 100 c.cm. on Nov. 22, 1937. A blood count on Nov. 22 gave hæmoglobin 80 per cent.; red cells 3,760,000; white cells 11,100 per c.mm.; polymorphonuclears 76 per cent.; lymphocytes 20 per cent; and monocytes 4 per cent.

Progress in hospital.—The condition was afebrile until three days before death, when the temperature rose because of bronchitis. The pulse was always rapid but regular, and its rate usually averaged 100 per minute. The illness was marked by periodic ups and downs. In the relapses the redness and swelling of the face became worse, the œdema of the legs and arms increased, salivation was more profuse, and swallowing was more painful. The relapses lasted a variable time, usually about a week, and were uninfluenced by any treatment. By the beginning of 1938 the œdema had almost entirely disappeared; as it waned, early muscular contracture appeared, particularly in the biceps. On admission the elbows could be fully extended, but by the end of 1937 this was becoming difficult, and by the end of January, 1938, extension was definitely limited, and the biceps muscle appeared on palpation harder than normal. For a fortnight before death salivation

was increased and swallowing very painful and difficult. The pain and sense of obstruction were felt in the chest and were undoubtedly due to the mediastinal condition found post mortem. A few days before death he developed a simple bronchitis, but owing to muscular weakness the cough was so ineffective that the condition became rapidly worse, and death ensued on March 1 from a suffocative bronchitis.

POST-MORTEM APPEARANCES

The body was that of a well-developed adult male. Numerous petechiæ were scattered over the surface of the heart and lungs. Between the trachea and the œsophagus there was a thickening of the mediastinal tissues; on section this was green and firm, suggesting to the naked eye much inspissated pneumococcal pus. At the time it was thought to be a chloroma. The green colour faded gradually on exposure to air, and the tissues finally remained as a thick white mass.

The liver was somewhat enlarged and on section was found studded with numerous yellowish nodules. The spleen was enlarged (275 g.). The Malpighian bodies were not recognisable, but on the cut surface there were numerous yellow nodules. The kidneys and suprarenals were apparently normal. The œsophagus was congested, with small superficial ulcers on the lower part. The stomach was normal. The mucosa of the duodenum was congested, especially in the jejunum and still more so in the ileum. The cæcum and colon were apparently normal. Many of the mesenteric lymphatic glands were enlarged.

All the muscles examined were pale and œdematous, the muscle bundles being apparently separated by a clear œdema fluid. The skin showed no abnormalities except the redness over the eyelids, bridge of the nose, and cheeks that had been present during life.

HISTOLOGICAL FINDINGS (DR. DYKE)

The mediastinal tumour on microscopical examination proves to be a thickening of the tissues between the œsophagus and the trachea due to a heavy infiltration of mononuclear cells with reactive and degenerative changes. Portions of the smooth muscle of both the œsophagus and the trachea are included in pieces of the mass removed for examination. The infiltrating round cells are mostly of one type, but include also a few plasma cells and histiocytes. The preponderating cells all show much degeneration, and most of the nuclei are in various degrees of pyknosis. So far as they present any definite characteristics, the nuclei are vesicular, and the cytoplasm is bulky and clear; the cells appear to belong to the "endothelial" order of cells, but the degeneration throughout the tumour mass makes definite identification impossible. The cells are scattered, in some places thickly, in others more discretely, in a matrix of the areolar tissue of the mediastinum; this is highly œdematous and, as previously remarked, includes portions of smooth muscle. The invasion of the tissues by the "endothelial" cells appeared to have been accompanied by little or no formation of stroma.

Portions of voluntary muscle from the principal masses of the limbs and trunk all show the same type of change, consisting of an intense œdema with some localised increase of fibrosis of the areolar tissue normally lying between the muscle bundles. This œdema has pushed the muscle bundles widely apart; this process is more conspicuous in some areas of individual muscles than in others, but is everywhere present. Accompanying this œdema is a degenerative process of the muscle-fibres themselves, shown by fragmentation and a hydropic type of degeneration of the muscle-fibres. In the more severely affected areas the muscle-fibres show increase of the nuclei, in many instances passing on to the formation of "muscle" giant-cells. The degenerative process appears to be accompanied by remarkably little replacement fibrosis. The muscles show a general infiltration by inflammatory cells of the plasma-cell and histiocyte type, this being more conspicuous in the more severely affected areas. A few cells of endothelial type are present, but no striking collections of these cells can be detected. The plasma-cell and histiocyte invasion is diffuse, passing in the planes between the muscle bundles; in some areas it is definitely perivascular, the vessels affected being of the arteriole class.

A few of the arterioles show blocking by masses of cells of the same type as those found in the mediastinal mass. When present this is a very striking feature, but it is not frequent, and it is difficult to be sure of its significance. Some of the capillaries and arterioles show a fair degree of proliferation of the endothelial cells of the intima.

The liver shows a moderate degree of perilobular infiltration by cells with large vesicular nuclei and bulky clear cytoplasm evidently of the "endothelial" order. The collections in the liver are not large, but in them the cells are not degenerate, and their histological appearances can be recognised much more clearly than those of the cells in the mediastinal mass; comparison of the endothelial cells found in the liver with the less degenerate of the cells in the mediastinal mass shows that they are all of the same "endothelial" order. In the infiltrated areas in the liver a few small giant-cells identical with those of lymphadenoma are found. The endothelial infiltration in the liver is unaccompanied by any type of inflammation cell.

The tissue round the œsophageal ulcers shows a heavy invasion by cells of the plasma-cell type together with histiocytes in fair numbers. None of the endothelial cells is to be seen, and the cellular infiltration here appears to be due to inflammation and related to the small ulcers; the mucous membrane of the œsophagus, apart from the small ulcers, appears healthy. The small bowel shows some atrophy and catarrhal desquamation of the mucous membrane; the walls appear healthy and free from infiltration by cells of any sort. An enlarged mesenteric lymph-node shows no abnormal change.

The spleen shows intense congestion amounting almost to infarction with destruction of the normal architecture and a generalised proliferation of, or infiltration by, cells of the endothelial type; the normal lymphocytes of the spleen appear only in scattered areas, and even these areas show the presence of the endothelial cells.

The heart-muscle shows swelling and early pyknosis of the nuclei of individual fibres, but the changes in this muscle are not of the same order as those in the voluntary muscles described above. The muscle-fibres show no fragmentation, nor are the muscle bundles pushed apart as in the voluntary muscles; there is no infiltration by any type of inflammation cell. The changes in the heart-muscle are such as might be found after any prolonged illness.

The most striking histological appearances in the tissues examined are those found in the mediastinal mass, the liver and spleen, and the voluntary muscles. The mediastinal mass is evidently produced by the proliferation and infiltration of the tissues by a type of mononuclear cell; as pointed out above, the tissue is so degenerate that it is impossible in this area to be certain of the nature of the cell; the liver shows a perilobular infiltration by cells evidently of the endothelial order, and comparison of sections of the liver with those of the mediastinal mass leaves little room for doubt that in these tissues the invading cells are identical. The spleen shows a great proliferation of the cells of the same order, and there is every reason to regard this cell as characteristic of the disorder. The histological findings then point to a proliferative and infiltrating reticulo-endotheliosis as the basic condition.

The changes in the voluntary muscle are striking and amply sufficient to account for the muscle symptoms. It is, however, difficult to link up the appearances found in the muscles with the reticulo-endotheliosis. These changes are mainly degenerative, with reactionary infiltration by inflammation cells; the characteristic endothelial cells appear only in relatively small numbers in the muscles, and it is difficult to understand why the muscular degeneration should have occurred.

Attention was drawn above to the presence of masses, apparently constituting thrombi, of degenerate cells apparently of the reticulo-endothelial order in some of the arterioles in the muscles and to the presence of some proliferation of the endothelial lining of the muscle capillaries. These changes, by interfering with the blood-supply, may account for the degenerative change in the muscles; the point, however, requires further observation.

DISCUSSION

The clinical history is typical of a severe dermatomyositis, the more important features of which are the rash on the face and the attacks of œdema in the limb muscles, with severe muscular weakness beginning to pass over into a fibrosis. The histological changes in the muscles are in complete agreement with those described by numerous observers (Nicolau 1929, Bezecny 1935, Zoon 1935, and Wolf and Wilens 1936) and there can be no doubt of the proper classification of this case under the title dermatomyositis. The relationship between this and the unexpected finding at autopsy of a generalised reticulo-endotheliosis, with localisation in the liver, spleen, and mediastinum, raises questions about the true nature of dermatomyositis, which with our present information can be more easily posed than answered. The comparatively acute nature of the illness, lasting only six months, and the presence of dysphagia throughout—doubtless attributable to the mediastinal condition—suggest that these two conditions were at any rate contemporaneous in development, and it is hard to avoid the suspicion that their mutual relation was still closer. The ætiology and pathology of dermatomyositis are obscure; but, if in the light of this case it is suggested that dermatomyositis may be a manifestation of disorder in the reticulo-endothelial system, it should be borne in mind that the prevailing type of change in both skin and muscle found by all observers is an infiltration by lymphocytes, large mononuclears, and plasma cells, with the development of fibrosis as the case becomes chronic, and giant cells have been described in the muscles by several authors (Wolf and Wilens 1936, and Schwartz, Grevilliot, and Gery 1937), as in this case. In addition to this general feature there are at least two case records which offer analogies with the present case.

(1) Urbach (1930) described the case of a woman aged 20 under the title of "dermatomyositis pseudoleucæmica." The disease lasted some three years. The skin lesions began with dryness and scaling, at first over the chest and later affecting the whole body. On the face there was swelling of the nose and both upper eyelids, associated with a reddish-brown violet tint. The muscular symptoms were great weakness, attacks of œdema, and, later, rigidity in the upper arms. Urbach for various reasons thinks that the clinical history is not quite typical of dermatomyositis, but it is difficult to agree with this opinion, for the account does not differ from the description of dermatomyositis by numerous other authors. Histologically, in the skin and muscles there was a diffuse infiltration, in many places perivascular, consisting of small lymphocytes, fibroblasts, and larger cells with clear protoplasm. He says: "if one only had the histological appearances . . . one would with little doubt make the diagnosis of lymphatic leukæmia." In actual fact his description of the infiltration differs only in degree from that found in other typical instances of dermatomyositis, (cf. Nicolau 1929), and his case is adduced here not so much on account of the "pseudoleukæmic" element as because it suggests that further histological examination of the skin and muscles of typical cases by modern methods should be undertaken to determine the provenance of the cells concerned.

(2) Schwartz, Grevilliot, and Gery (1937) have described a remarkable case under the title of "réticulogranulomatose maligne à prédominance cutanée et musculaire (dermatomyosite) avec état leucémique terminal," which is closely parallel to the present case. It concerned a male aged 35, whose illness lasted nineteen months. The skin lesions affected the face and limbs, were œdematous and reddish-blue, and tended to hyperkeratosis. The muscles were weak and subject to periodic swellings. There was also a constant dysphagia. Death occurred from pneumonia. Histologically, there was severe infiltration of the skin and muscles, of a type considered by the authors to be "granulomatous." The cells composing these masses were (*a*) white cells "almost without exception mononuclear; they resemble monocytes or more rarely lymphocytes or plasmocytes"; and (*b*) "large cells very like the epithelioid cells of a malignant lymphogranuloma." The importance of the case is that, in addition to the skin and muscles, a similar infiltration was widespread in the body, being found in the bowel, epiglottis, thyroid, kidney, pancreas, and suprarenal. In view of these findings the authors consider that dermatomyositis should be classified as a "malignant reticulogranulomatosis with cutaneous and muscular predominance."

The case we report here appears to support their suggestion that dermatomyositis is a disorder of the reticulo-endothelial system which may at times have wider manifestations than the customary ones in skin and muscle. The possible rôle of the reticulo-endothelial system in the genesis of dermatomyositis deserves to be studied further.

SUMMARY

A fatal case of dermatomyositis is described in which a generalised reticulo-endotheliosis was unexpectedly found post mortem, one of its manifestations being a thickening of the mediastinal tissues by proliferation and infiltration of mononuclear cells, whose exact type could not be identified owing to degeneration. An apparently identical infiltration of liver and spleen was due to endothelial cells. The changes in the muscles were apparently due to inflammation and degeneration, very few endothelial cells being found; but a few arterioles were blocked by masses of apparently reticulo-endothelial cells. It is suggested that the basis of dermatomyositis is a reaction of the reticulo-endothelial system—usually local but occasionally generalised—to some cause as yet unknown.

Our thanks are due to Dr. S. Robinson, of Wolverhampton, with whom we first saw the case.

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TETANY IN A SUCKLING

WITH LATENT OSTEITIS FIBROSA IN THE MOTHER

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IN recent years a good many cases of tetany in newborn infants have been reported in which the only symptom of tetany was spasms and the diagnosis was verified by the demonstration of hypocalcæmia. Barkwin (1937) has correlated this hypocalcæmia with a temporary hypofunction of the infant's parathyroid gland due to overproduction of parathyroid hormone in the mother.

Since the pathogenesis of tetany in the newborn is not yet known, I report a case of tetany in a suckling aged 5 months in which it was definitely demonstrated that the hypocalcæmia was due to overproduction of parathyroid hormone in the mother. Although in this case there is no question of tetany in a newborn infant, the demonstration of the mother's parathyroid affection may shed some light on the function of the parathyroid gland in the newly born.

CASE RECORD

On May 22, 1935, a female infant, aged 5 months, was admitted to the Sundby Hospital; she had suddenly collapsed, lay with her hands in a tetany position, and had laryngeal spasm. She had been born five weeks before term and had received mother's milk alone during the first three months, subsequently receiving a milk mixture in the day and mother's milk twice every night. She was immediately given calcium chloride 1 gramme thrice daily, vitamin D (5000 international units daily), and oatmeal soup. Next day, however, there were incipient convulsions; Trousseau's phenomenon; laryngeal spasm; no facialis phenomenon; cathodal opening contraction: 2–3 milliamperes; serum calcium 6·7 mg. per 100 c.cm. The patient now received about 200 g. of mother's milk a day besides oatmeal soup during the first two days and, later, cow's milk also. Despite this treatment the laryngeal spasms persisted whereas the convulsions and Trousseau's phenomenon disappeared.

FIG. 1—Radiogram of osteitis fibrosa of right femur.

Since the serum calcium twelve days after admission (June 4) still amounted to 6·7 mg. per 100 c.cm., the administration of vitamin D was discontinued, and radiotherapy was substituted, to which the laryngeal spasms did not yield entirely, however. As the serum calcium was still low —namely, 6·9 mg. per 100 c.cm. —on the 13th, the treatment not having produced any effect on the calcium equilibrium, the administration of calcium and vitamin D and the radiotherapy were discontinued, and ordinary mixed diet with 600 g. of milk and purée was substituted. At that time the mother's milk was exhausted. This did not affect the child's condition at all, but the calcium equilibrium remained about 6·7 mg. per 100 c.cm., and the respiration was slightly laboured. The blood phosphatase (Kay) was low: 0·12 mg. per 100 c.cm., blood-urea being 17·5 mg. per 100 c.cm. and the electrocardiogram normal. The glucose-tolerance test gave a normal curve.

Two months after admission (July 29) the serum calcium amounted to 9 mg. per 100 c.cm. and the serum phosphorus to 8 mg. per 100 c.cm. The laryngeal spasms had ceased entirely.

Since this suckling presented symptoms of tetany and a low calcium equilibrium which did not respond to calcium chloride, vitamin D, radiotherapy, or mother's milk, it was evident that the condition was not an ordinary infantile tetany but must be a special form of parathyroid insufficiency. Therefore the mother was submitted to examination.

FIG. 2—Adenoma removed from parathyroid gland. (Scale in centimetres.)

She was 23 years old, very short, and slim (weight 40 kg., height 149 cm.). Since she had never presented any morbid symptoms except a little tiredness during the last few years, the detection of 16·4 mg. per 100 c.cm. of serum calcium was astonishing. Blood phosphorus 2·5 mg. per 100 c.cm., blood phosphatase 0·90 mg. per 100 c.cm. (considerably increased), blood-urea 19·5 mg. per 100 c.cm. Electrocardiogram normal. Repeated examinations of the serum calcium always revealed values of 15–16·4 mg. per 100 c.cm.

The suspicion that she suffered from hyperthyroidism was confirmed by radiography of her kidneys and bones. In both renal regions were found irregular granular deposits of calcium corresponding to the calyces on either side. A cavity the size of a small apple was subsequently found in the left pelvic bone. A cavity about 8 cm. in diameter was likewise found in the uppermost part of the right femur (fig. 1). All the other bones were normal.

The mother's milk was tested for calcium and phosphorus and compared with the milk of the wet-nurse; the result was that the calcium content of her milk exceeded that of normal mother's milk by a third, whereas the amount of phosphorus excreted in the two women's milk was identical.

—	Mother's milk	Control milk
Calcium	0·033	0·025
Phosphorus	0·0112	0·0116
Sample	97 g. of milk	103 g. of milk

The calcium excretion in the urine was increased, for it amounted to 27·9 mg. per 100 c.cm. Basal metabolism 86 per cent. Fasting blood-sugar 0·90 per cent. Blood-urea 35 mg. per 100 c.cm.

Since palpation (about two months after the infant's admission to hospital) revealed a swelling of the mother's thyroid gland, she was transferred to the department of Dr. O. Chievitz, who operated on her and removed a parathyroid adenoma the size of a hazel-nut (fig. 2). Microscopy of the tumour showed a structure of medium-sized almost cylindrical epithelial cells with a fair amount of very finely granular protoplasm and comparatively large round or oval nuclei lying in the part of the cell farthest from the vessels. The cells were arranged in the form of trabeculæ; hence a longitudinal section as a rule presented two rows of cells. Between the trabeculæ of cells were interposed thin-walled vessels, some of which were very hyperæmic. In relation to the vessels the cells were arranged radially; this was most clearly seen in transverse sections. The picture thus corresponded to a parathyroid gland in

the active stage, but at the same time there was nodiform hyperplasia. The diagnosis was made of hyperplastic adenomatous parathyroid gland.

Subsequently the mother's blood calcium became normal. Both mother and child have been well during the past four years.

DISCUSSION

This is a case of tetany with persistent hypocalcæmia in a suckling whose mother proved to have an adenoma in the parathyroid gland and latent osteitis fibrosa coupled with hypercalcæmia. What relationship is there between these two observations? And how shall we endeavour to explain the child's persistently low calcium equilibrium, which does not respond to the usual treatment for tetany? The answer is entirely hypothetical, and I have thought of the following possibility.

The fœtus in utero, owing to the mother's hyperparathyroidism, has been under too strong an influence of the parathyroid hormone, which has hampered the development of the fœtal parathyroid glands. When the infant was born, its parathyroid glands could not perform their proper function so long as the infant received its mother's milk, and the result was hypocalcæmia. After the lapse of some time, during which the child received no mother's milk, the inactive parathyroid glands became efficient and raised the calcium equilibrium in the blood to normal values.

This hypothesis is supported by the fact that radiography of the 5-month infant's carpus and ulnar epiphysis revealed that the development of the bone nuclei corresponded to that of a 17-month child. This means that, owing to the influence of the mother's parathyroid hormone during fœtal life, a premature calcification of the infant's bone nuclei had taken place. After birth this inactivity of the infant's parathyroid glands with concomitant low calcium equilibrium persisted till the glands gradually acquired the efficiency which ensured their normal function.

This hypothesis affords the best possibility of explaining the combination of hypocalcæmia in the infant with hypercalcæmia in the mother. The fact that the infant's low calcium equilibrium did not cause symptoms of tetany during the first months when she received only mother's milk can be explained by the mother's blood phosphorus balancing the calcium content. However, when the mother's milk was replaced by cow's milk and the infant thus received a great deal of phosphate, the symptoms of tetany appeared, because the phosphorus content of cow's milk is six times as great as that of mother's milk. That the quantity of phosphates plays an essential part in the serum calcium balance is well known. Binger (1917) by intravenous injections of phosphate solutions experimentally provoked hypocalcæmic tetany, and Jeppson and af Klercker (1921) subsequently provoked tetany in children by peroral administration of phosphates. Salvesen, Hastings, and McIntosh (1924) reported similar results obtained in dogs.

The present case may thus be interpreted as one of phosphate tetany due to hypofunction of the infant's parathyroid gland. The latent hypoparathyroidism became manifest because of the transition from the mother's milk to cow's milk with its far greater content of phosphorus. Not till two months after the stopping of mother's milk did the infant's calcium equilibrium become normal. This shows that the infant's parathyroid glands must train themselves slowly before they can perform their normal function. It is this gradual training of the function of the parathyroid glands which can be paralleled by the conditions in tetany in the newborn infant. As shown by Barkwin (1937), the infant immediately after birth normally incurs a sudden decrease of the blood calcium, which in normal circumstances is very brief. Barkwin explains this phenomenon by temporary inactivity of the parathyroid glands which in the newborn rapidly acquire their normal function. In the present case, however, there was severe and protracted inactivity due to the mother's hyperparathyroidism; hence the long interval before the infant's blood calcium became normal.

Investigations reported by Hoffmann (1933) and Hamilton, Dasef, and Highmann (1936) render it probable that the concentration of the parathyroid hormone in the blood is higher during pregnancy than in non-pregnant women. This hyperparathyroidism of pregnancy normally disappears immediately after parturition. The hyperfunction of the parathyroid glands in pregnancy thus affords an explanation of the slight hypocalcæmia (from 11·00 mg. per 100 c.cm. in the blood from the umbilical cord to 9·76 mg. per 100 c.cm. on the 3rd–5th day) observed in infants immediately after birth. In special circumstances this hypocalcæmia may be exacerbated and persist beyond the first few days and cause spasms which, in the newborn, must be interpreted as tetany.

The present case shows that we must pay attention to those tetanies in infants which do not respond at once to the ordinary treatment with vitamin D and calcium, and that, in such cases as well as in cases of tetany in newborn children, the mother must be submitted to a calcium test. Thus, in the present case examination of the child alone cast suspicion upon the mother who, thanks to an early operation on the parathyroid gland at a time when she presented no other symptom besides tiredness, was saved from the serious symptoms which otherwise accompany manifest osteitis fibrosa.

SUMMARY

(1) The atypical course of infantile tetany observed in a suckling led to an examination of the mother, who was found to have latent osteitis fibrosa. She recovered after removal of an adenoma in the parathyroid gland. (2) It is shown that the hypocalcæmia in the infant was due to the hypercalcæmia in the mother. (3) It is suggested that, owing to the abundance of maternal parathyroid hormones reaching the fœtus in utero, the infant's parathyroid glands had not developed normally, and that inhibition was continued after birth so long as the infant was fed on the mother's milk, but that, after the mother's milk was stopped, the infant's parathyroid glands gradually began to function. (4) This theory is supported by the fact that, radiographically, the infant's bone nuclei corresponded to those of a child of seventeen months. (5) The symptoms of tetany did not appear while the infant was on mother's milk alone, but they appeared when cow's milk was added to the diet. This is held to be due to the greater phosphorus content of the latter.

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SPINAL LEPTOMENINGIOMA

RESTORATION OF FUNCTION AFTER OPERATION

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SINCE Sir Victor Horsley successfully removed a tumour from the spinal cord fifty years ago, descriptions of tumours of the spinal cord, more frequent in the Continental and American literature, have included Elsberg's monograph (1925) of 100 personal cases and Learmonth's classical publication (1927) of 60 examples of leptomeningioma seen at the Mayo Clinic. In his Hunterian lecture (1935) Lambert Rogers mentioned the anatomical distribution of 411 spinal tumours. Many cases of this type probably still pass unrecognised.

The comparative rarity of these tumours justifies a description of a case reflecting many of the important features of spinal leptomeningioma.

CASE RECORD

The patient was a hard-working woman aged 56, of heavy build. She had enjoyed good health until the winter of 1934–35, when she complained of pain below the left breast tending to radiate from the side to the front, intermittent, dull and aching, aggravated during fatigue but unaffected by position. In June, 1935, she noticed a feeling of numbness and weakness of the left leg, which sometimes "gave way" with consequent falls. In July movement of the left leg became stiff, and the right leg began to be affected by numbness and stiffness. In August walking was extremely difficult, and a month later both motor power and sensation were absent from the legs. At the beginning of October, 9 months from the onset of symptoms, defæcation and micturition occurred automatically at intervals without knowledge. Since the early months of illness there had been no pain.

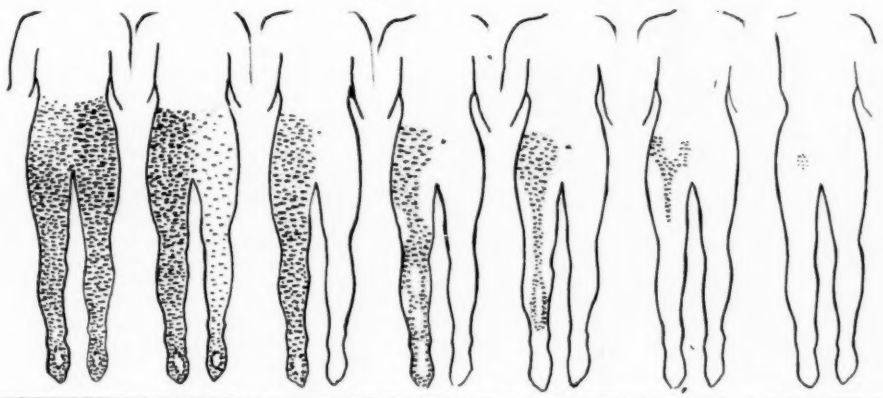
In hospital on Oct. 20, 1935, the patient lay recumbent and unable to move the trunk or legs, which were spastic in extension. The tongue was dry and furred. Alimentary, respiratory, and cardio-vascular systems appeared healthy. The blood pressure was 140/90 mm. The urine was normal. Hæmatological examination showed a secondary anæmia of moderate degree. The Wassermann reaction of the blood was negative.

Both legs were powerless and spastic, with hips, knees, and ankles extended. The pupillary reflexes were normal, the abdominal not elicited, and the patellar and Achilles much exaggerated on both sides; the plantar response was extensor on both sides. Oppenheim and Gordon tests were positive on both sides. Knee- and ankle-clonus were well marked on both sides.

There was no tenderness over the spine, nor was there any evident hyperæsthesia. Sensation of touch, pain, and temperature was lost below a level two inches above the umbilicus, the upper limit being more clearly demarcated on the left side. Sensation was present over an area on the dorsum of each foot. Sense of position and appreciation of movement were absent in both legs. Vibration sense was absent below the waist (fig. 1).

Preliminary lumbar puncture showed fluid under much increased pressure, xanthochromia, globulin + +, and protein + + (0·18 per cent.). Cisternal puncture revealed clear fluid under normal pressure, with an average amount of globulin and protein (0·015 per cent.), no cells, and sterile. Thecography after injection of 2 c.cm. of Lipiodol Descendens showed a spinal block at a level opposite the body of the sixth

FIG. 1



Time. ..	Before operation.		After lumbar puncture.		After operation—7th day.		9th day.		11th day.		14th day.		17th day.	
Knee-jerks ..	+ ++	+ +++	+ ++	+ +++	+ ++	+ ++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +
Ankle-jerks ..	++	++	++	++	++	+	+	+	±	±	±	±	±	±
Knee-clonus ..	+	+	+	+	Slight.	Slight.	–	–	–	–	–	–	–	–
Ankle-clonus ..	+	+	+	+	Slight.	Slight.	Slight.	Slight.	Slight.	Slight.	V. slight.	Slight.	V. slight.	V. slight.
Babinski ..	++	++	++	++	+	+	+	+	+	+	+	+	+	+
Oppenheim ..	+	+	+	+	+	+	+	+	+	+	+	+	–	–
Bowel	Automatic.		Automatic.		Normal control.		Normal control.		Normal control.		Normal control.		Normal control.	
Bladder.. ..	Automatic.		Retention; overflow.		Retention; catheterised.		Retention; catheterised.		Retention; catheterised.		Normal micturition.		Normal micturition.	

thoracic vertebra. There was no evident abnormality of the vertebræ.

Lumbar puncture was repeated one week later, when 10 c.cm. of fluid was aspirated. A few hours later examination showed that anæsthesia, analgesia, and thermanæsthesia were less complete over the left leg and left half of the abdomen, while the corresponding sensory loss was more definite and the upper limit more clearly demarcated on the right side. Further, radiography showed that the lipiodol which had remained in situ for one week had descended to a lower level. The bladder became distended, and "overflow incontinence" replaced automatic micturition. An extramedullary tumour at the level of sixth thoracic vertebra (eighth spinal segment), postero-lateral to the cord, was diagnosed.

Operation (R. M. H.).—On Nov. 10, 1935, under nitrous oxide, oxygen, and a small quantity of ether (Dr. A. V. Neilson), laminectomy of the sixth, seventh, and fifth thoracic vertebræ was performed. The lower half of the exposed dura was firm and non-pulsatile, and the extradural veins were widely dilated. The upper half showed normal pulsation. On incision of the dura the upper part collapsed, while the lower part remained expanded and fixed. Retraction of the dural flap revealed a pink translucent ovoid tumour, 1·5 cm. in the transverse axis by 2 cm. in the longitudinal axis, overlying the left postero-lateral quadrant of the cord, which was compressed (figs. 2 and 3). On the surface were two stellate calcified plaques, each the size of a pin's head. The capsule was incorporated with the arachnoid, which became torn, cerebro-spinal fluid and lipiodol globules escaping. Attachment to the dura was readily separated, and

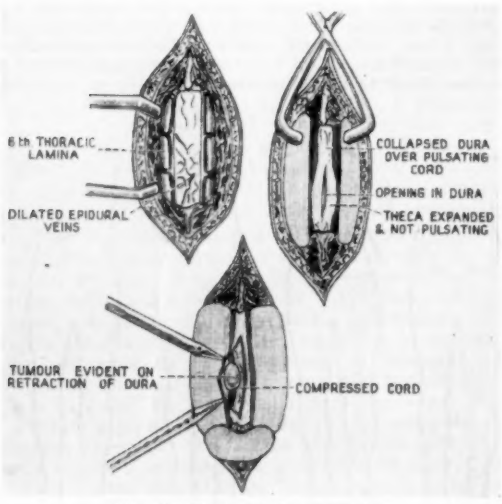


FIG. 2—Steps of the operation.

the tumour was removed. The dura and overlying tissues were closed in layers.

Pathological report.—The histology was characteristic of an avascular meningioma showing "psammoma bodies." The tumour was very cellular with little connective tissue matrix. The flattened endothelial cells, some spindle-shaped, were arranged in typical concentric masses. There was no palisading of nuclei.

Post-operative course.—Six-hourly catheterisation was performed. Slight abdominal distension on the second and third days was relieved by enemata and injections of atropine. The subsequent progress indicated in fig. 1 may be summarised as follows: on the 4th day the bowels moved spontaneously and consciously; on the 5th day there was a sensation of burning and spasmodic involuntary movements of the legs; on the 7th day there was voluntary slight flexion of hips; on the 13th day bladder control was established and thereafter maintained, and thermal sensibility was present over anæsthetic areas of the right leg; on the 21st day there was an almost complete return of sensation, motor power returning more rapidly in the right leg; on the 31st day the patient was sitting up in bed; on the 59th day she walked several yards; on the 77th day Babinski's sign was positive on both sides, and ankle-clonus was perceptible on the left side and absent on the right; after 3 months the patient walked with the aid of a stick; after 5 months she was discharged from hospital, walking well with a stamping gait, a tendency to inturning of the toes, and a positive Babinski's sign on both sides; after 10 months she was doing normal housework (brisk knee-jerks and a doubtful positive Babinski's sign on both sides); and after 2¼ years she is living a normal life and has gained weight (left knee-jerk present, right absent; Babinski's sign doubtfully positive on the left and markedly positive on the right).

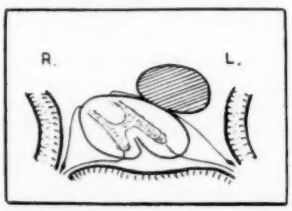


FIG. 3 — Diagram showing position of tumour in relation to the cord.

DISCUSSION

The customary phases of spinal compression are (1) root cycle, (2) Brown-Séquard syndrome, and (3) complete paraplegia with urinary and rectal incontinence. The first symptom in the case described was root pain, which Elsberg found as the initial symptom in 27 of 41 of his cases of extramedullary tumour. The second phase was reached 6 months from the onset. The contralateral sensory disturbance was probably masked by or confused with the feeling of weakness in the right leg resulting from pressure exerted diametrically on the anterior spinocerebellar tract of the side opposite to the tumour. Lambert Rogers states that the Brown-Séquard syndrome is rarely seen except in tumours of the cervical region, because hemicompression soon becomes bilateral compression. The third stage was achieved within the short period of 10 months from the onset. The corresponding period in the dorsal tumours of Learmonth's series was 23 months. The level of anæsthesia corresponded approximately to the lowest segment involved, as is customary in late cases. The explanation of the persistence of areas of sensibility on the dorsum of the feet is that offered by several authorities, who state that the fibres in the spinothalamic tracts are so arranged that those corresponding to the lowest dermatomes are placed the most centrally. This theory does not entirely account for the absence of sensation on the lateral areas of the legs which are supplied by a lower segment (S. 2). In this example there was no evidence of trophic disturbances of the legs. Nocturnal incontinence, which is said to mark the onset of bladder involvement, was absent.

The changes in the cerebro-spinal fluid were those usually associated with spinal compression. Xanthochromia, noted in the lumbar fluid, is present in approximately half of such cases. The protein content of the lumbar fluid was twelve times that of the cisternal fluid. Elsberg noted this in 49 out of 59 cases and Learmonth in 66·7 per cent. The readings of pressure of the spinal fluid vary with different observers. In this case the pressure in the

lumbar region was much increased. The explanation of such increase is probably twofold: the tumour acting as a valve permitting the downflow but obstructing the upflow of fluid, and the transudation from the dilated venous system below the level of obstruction.

Elsberg has drawn attention to the diagnostic value of changes of clinical findings after withdrawal of cerebro-spinal fluid below the obstruction In the case described aspiration of fluid produced diminution of the sensory disturbance on the homolateral side and increase on the contralateral side of the abdomen, where the level of anæsthesia became more clearly defined. The effect on the bladder was distension with "overflow incontinence." Several authorities state that retention of urine with overflow incontinence is absent in spinal compression, automatic micturition being maintained by the local vesical plexus (Denny-Brown and Robertson 1933). The phenomenon described appears to be the result of alteration of the degree of compression, by which an increase in tonus of the external sphincter had caused distension of the bladder to the limit of sphincteric resistance. This state is therefore not a true incontinence but an automatic flow from a distended bladder.

The restoration of function is said to vary in extent, more particularly according to the duration of paralysis rather than to the duration of the symptoms. Following the customary centripetal course the recovery of sensation was unusually rapid and was almost complete on the left side at the end of seven days. At this stage the appearance resembled more closely than before the Brown-Séquard syndrome, indicating the more rapid recovery of the contralateral tracts. Daily changes made impossible an accurate record of dissociated sensibility. Joint sense remained incomplete for many weeks, and coördination of movement was inaccurate long after motor power had been regained.

SUMMARY

A woman of 56 developed symptoms and signs suggesting extramedullary tumour, and at operation an avascular meningioma was found at the level of the sixth thoracic vertebra. Removal of the tumour was followed by almost complete recovery.

We wish to record our indebtedness to Colonel W. F. Harvey of the Royal College of Physicians laboratory, Edinburgh, for his opinion on the pathological appearances.

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CLINICAL AND LABORATORY NOTES

MERCURY POISONING

TREATED WITH SODIUM FORMALDEHYDE SULPHOXYLATE

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ACUTE mercury poisoning is uncommon, and the case here described is I think the first recorded in this country in which poisoning by mercuric chloride (corrosive sublimate) has been treated with sodium formaldehyde sulphoxylate.

McPeek (1920) reported a case in which acute poisoning developed following the use of a vaginal douche containing an undissolved tablet of 7 grains of mercuric chloride. His patient developed violent abdominal pain, nausea and vomiting, and fainting attacks, followed later by stomatitis, vaginitis, blood-stained stools, and residual renal damage. Holterman (1925) described ten cases of poisoning due to absorption of mercuric chloride from the vagina. Seven of these were fatal, the amount of mercuric chloride introduced varying from 0·25 to 3 grammes.

The patient, a man aged 56, was admitted to King Edward VII Hospital, Windsor, on Sept. 8, 1938. His history was as follows. He was under treatment from his own doctor for tertiary syphilis of the nervous system; his Wassermann reaction was strongly positive and he had also a urethral stricture due to an old gonorrhœa. The treatment given was inunction of mercury; but unfortunately, instead of ung. hydrarg. pur. 1 in 3 he received an ointment containing one part in three of mercuric chloride. The patient, assisted by his wife, inuncted himself liberally on his right arm and shoulder with this ointment. As a result he sustained severe burns of the right arm and shoulder and symptoms and signs of acute mercurial poisoning. His wife's hands were slightly burnt.

On admission to hospital he was shocked, collapsed, and semicomatose; his pulse was weak and rapid, varying between 100 and 120 per minute. He passed a blood-stained stool soon after admission, and he had a mild stomatitis. His urine contained albumin and many casts, with a few pus cells.

After immediate treatment for shock by warmth and Coramine injections, an intravenous injection of 0·5 g. of sodium thiosulphate was given and 3½ pints of saline was given by intravenous drip. The extensive burns of the right arm and shoulder were treated by removal of the dead tissue and painting several times with a solution of 10 per cent. tannic acid with 0·5 per cent. acriflavine. A drachm of sodium bicarbonate was given by mouth every three hours. Next day the patient's condition had slightly improved. A supply of sodium formaldehyde sulphoxylate was obtained from British Drug Houses Ltd., and 10 g. in 10 per cent. solution was given intravenously daily for three days. At the end of this time he had improved so much that further injections were considered unnecessary. The drug appeared to have a strongly diuretic effect and he was incontinent of urine after each injection.

The patient subsequently developed a broncho-pneumonia which cleared up and auricular fibrillation which was treated by full digitalisation and later stopped spontaneously. The burns suppurated to some extent but eventually healed completely. Giving potassium iodide resulted in a skin rash, so no further anti-syphilitic treatment was attempted. He was discharged from hospital on Nov. 2, 1938. At this time his mental state suggested general paralysis of the insane. He had Argyll Robertson pupils, increased knee- and ankle-jerks, and extensor plantar responses. His urine contained a faint trace of albumin and a few hyaline and granular casts. His blood-urea was 28 mg. per 100 c.cm.

An interesting point in this case is the remarkable improvement which followed the intravenous injection of sodium formaldehyde sulphoxylate. Rosenthal (1934) first described the use of this drug as an antidote for mercury poisoning. He showed that it is a strong reducing agent in vitro. In dogs, he found that it was excreted by the kidneys in a few hours and reached a high concentration in these organs. Intra-

venous injection of the drug protected dogs against renal damage in experimental poisoning by mercuric chloride and produced no toxic symptoms. He treated ten cases of acute poisoning due to oral ingestion of mercuric chloride with sodium formaldehyde sulphoxylate. The method consisted of gastric lavage with a 5 per cent. solution, 200 c.cm. being left in the stomach; the intravenous injection of 10 g. of the substance in 5–10 per cent. solution, the dose being repeated in 4–6 hours. High colonic lavage with a 1 in 1000 solution was also given. All the cases recovered.

Robertson and Tuck (1935) describe a case of acute mercuric chloride poisoning successfully treated by sodium formaldehyde sulphoxylate. Their technique was similar to that of Rosenthal. They state that the drug is of low toxicity, is a powerful reducing agent, and is more stable in the body than sodium thiosulphate or sodium hydrosulphite.

My thanks are due to Dr. F. J. Hathaway, senior surgeon to King Edward VII Hospital, Windsor, for permission to publish notes of this case.

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TREATMENT OF PROLAPSED THROMBOSED INTERNAL HÆMORRHOIDS

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THE standard treatment of this condition, designated by the lay public "an attack of piles," is unsatisfactory, inadequate, and slow in making its effect. Although there is a tendency for those suffering from internal hæmorrhoids to apply for treatment earlier in the course of the disease, acute thrombophlebitis with prolapse is still a common condition. The severe pain and distress experienced by these patients is well known to all those working in a surgical out-patient department.

Not infrequently the condition progresses from thrombosis to ulceration and sloughing, largely owing to the superimposed sphincteric spasm. It is the latter factor which has in my opinion been neglected in the therapeutic approach. The clamp-and-cautery (or diathermy) operation, previously advocated for treatment at this stage, appears to violate elementary surgical principles, and is less popular now than formerly. Gabriel (1933) compares the removal of a sloughing pile with the operation of tonsillectomy during an attack of acute tonsillitis. Buie (1937) also urges palliative measures during the acute phase. At least three weeks must elapse before either operation or carbolic injections can be safely undertaken, and during the first few days of this period the patient suffers from great pain and discomfort.

The therapeutic measures advocated in the leading textbooks of proctology do not appear to approach the core of the problem. These measures include the following:—

1. Confinement to bed, the foot of the bed being raised on blocks.
2. Shaving the anus and applying a 1 in 2000 aqueous solution of perchloride of mercury. Sometimes, cold compresses or hot fomentations are advised. Yeomans (1929) suggests painting the affected part with adrenaline solution.
3. Digital dilatation of the sphincter under anæsthesia, and reduction of the prolapsed mass (Lockhart-Mummery 1934).
4. The application of analgesic ointments both to the thrombosed piles and to the anal lumen by means of a special nozzle.
5. Various suppositories.
6. The application of mercurochrome or ichthyol to the surfaces of any ulcers which develop following separation of the slough.
7. The administration of large quantities of liquid paraffin by mouth to render the stools as soft as possible.

Reduction should be attempted only in selected cases. Often the mass reappears outside the anus as soon as the reducing finger is withdrawn. Again, when the inflammatory reaction has reached the indurative stage, it is quite impossible to reduce the mass into the bowel even under anæsthesia and after dilatation of the sphincter. It is in this type that forcible and repeated attempts at reduction are contra-indicated and may be definitely harmful. Reduction, to be successful, must be carried out shortly after the prolapse has occurred, and anæsthesia may be necessary. Once the sphincteric spasm has increased the œdema, and the prolapsed portion has become stiff and indurated, reduction cannot be usefully carried out. It is also a mistake to attempt reduction in cases of strangulated extero-internal hæmorrhoids. A great part of the protruding mass is normally outside, and when replaced, the entire swelling descends almost immediately.

Sphincteric injection.—It has been my practice during the last three years to inject an oily anæsthetic solution into the external sphincter, bearing in mind the three portions of this muscle so ably described by Milligan and Morgan (1934). The effects of this injection are most satisfactory. Pain is largely eliminated within an hour of injection and as the sphincteric spasm is relaxed, reduction, previously impossible, may be carried out readily and relatively painlessly. If the prolapsed mass is indurated, and reduction therefore not attempted, the sphincteric relaxation promotes a rapid subsidence of the swelling, improves the venous and lymphatic drainage, and permits the œdema and induration to subside.

The technique is simple. A serum needle, rather longer than the average, is introduced through the skin about one and a quarter inches behind the anus, and 5 c.cm. of the oily anæsthetic solution is injected into the sphincter muscle on each side, 10 c.cm. in all being used. A finger in the rectum is helpful in judging the correct plane and in avoiding too close an approach to the thrombophlebitic area. The actual injection can be rendered painless by raising a subcuticular weal with 1 per cent. procaine, and by anæsthetising the track of the needle with the same solution. The only complication to be feared is that of carrying infection from the skin into the deeper layers, but this can be avoided by meticulous care in preparing the site of injection, and by introducing the needle some little distance from the anal verge. For this reason, the needle used is rather longer than the average serum needle. The rate of injection is necessarily slow, because of the viscidity of the oily solution, and often the gradual relaxation of the muscle can be appreciated by the finger in the anal lumen.

The oily anæsthetic solution I have been accustomed to use is Proctocaine, but there are numerous other preparations equally effective.

In conclusion, I suggest that the method of sphincteric injection is worthy of trial in cases of acute thrombophlebitis with prolapse, since it leads to immediate relief of pain and rapid subsidence of the inflammatory swelling.

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SIMPLE FRACTURE OF PATELLA TREATED BY REMOVAL OF FRAGMENTS

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Removal of the patella in cases of its fracture has been shown by Brooke (1937) to be compatible with increased power of the knee, and a case of comminuted fracture of the patella was treated successfully by removal of the fragments by Tippett (1937). The following is a report of a case similarly treated.

CASE RECORD

The patient, a man aged 25, was admitted on July 17, 1938, to the Shebeen el Kom Hospital with a simple transverse fracture of right patella due to a blow from a *naboot* (quarterstaff). Radiography showed a large upper fragment and a small lower fragment.

Operation.—On the fourth day after admission a longitudinal incision was made anteriorly in the middle line, the hæmatoma was wiped out, and both fragments were removed, but the aponeurotic fibres of the extensor group on the surface and on both sides of the fragments were preserved; the lower end of the quadriceps femoris tendon and the upper end of the ligamentum patellæ were trimmed and stitched end to end with interrupted stitches of silk. The wound healed by first intention and the patient was discharged after three weeks, walking without a supporting stick. Three months later patient could walk and run perfectly. The knee operated upon is as strong as the other, passive movement being free, not limited, and painless. A hard osseous mass, which can be felt in the tendon, causes a shadow on radiography and is probably new bone formation from osteoblasts left with the periosteum (see figure). The patient can stand on the limb operated upon with the knee semi-flexed, proving that the joint is very strong.

Radiogram three months after removal of patella, showing new formation of bone.

The advantages of this operation are: (1) it is easier than suturing bony fragments; (2) it can be performed early, and convalescence is short; and (3) complications that may attend suture of bony fragments do not arise.

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NEW INVENTIONS

CLIPS FOR FRACTURES

These clips have been designed to hold firmly the strips of flannel bandage which support a limb between the side bars of a Thomas or any other skeletal splint (fig. 1). They permit of accurate adjustment and are suitable for both the 2½ in. strips usually used with arm splints and the 4 in. strips used to support the lower limb. They will also fix the strips which are applied to either side bar of the splint to correct lateral deviation of the fracture. They are removed with a special lever key (figs. 2 and 3).

Fig. 1—Clip in position.

Fig. 2—Lever key for removing clip.

The clips are simpler, more efficient, and neater than the metal paper clips which I introduced during the late war and which are now universally used. They also have the advantage of being wholly under the control of the surgeon or his staff, for they can only be released with the special key. This means that a mischievous or mental patient cannot loosen them and disturb his fracture. The clips throw a minimum shadow on a radiogram, especially in the lateral view, though for mechanical reasons they have to be manufactured a little broader than the side bars of a Thomas splint to lessen metal fatigue. They do away with the necessity for radiologists or others having to replace the clips by safety-pins in order to get a better lateral view of the fragments or bone, a procedure that may spoil the position of a reduced fracture.

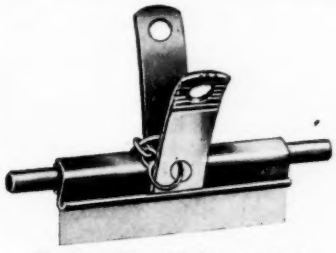

Fig. 3.—Clip with key applied.

The clips have been made for me by Messrs. Philip Harris and Co., 144, Edmund Street, Birmingham.

Meurice Sinclair, M.B. Edin.
Major, R.A.M.C. (retd.)

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF THERAPEUTICS AND PHARMACOLOGY

AT a meeting of this section held on Jan. 10, with Dr. J. W. TREVAN, the president, in the chair, a discussion on the clinical aspects of the

Vitamin-B Complex

was opened by Prof. R. A. PETERS, F.R.S. (Oxford). The anti-beriberi vitamin, B_1, he said, was an essential component of many varieties of living cells and was probably universally needed. It was a pyramidon thiazole compound and the second most important of the seven vitamin-B components, the most important being the anti-pellagra nicotinic acid. Lactoflavine, another factor in the compound, might or might not be important; a vitamin deficiency only showed up when it was gross. In the yeast cell B_1 was the coenzyme to carboxylase, which was needed in an essential stage of the production of alcohol by fermentation—i.e., the conversion of pyruvic acid to acetaldehyde. Without B_1 there could be no alcoholic drinks. The vitamin had to be converted into a diphosphate, and this diphospho vitamin B_1 was found in the higher animals and was formed rapidly in their livers. This same compound was therefore thought provisionally to be the active mammalian form. Here again it was responsible for the metabolism of pyruvic acid, but the products were different from those produced by the process in yeast. Pyruvic acid was an intermediary between carbohydrate and lactic acid in the degradation of endogenous carbohydrate. A primary change in tissue-cell metabolism would secondarily alter the whole carbohydrate metabolism of the body; this was believed to be the mechanism in vitamin-B_1 deficiency. Sugar-tolerance changes and alterations in temperature were found in the terminal stages; and pyruvic acid accumulated in the blood. Experiments with the mashed brains of pigeons suffering from B_1 deficiency had supported this view. When vitamin B_1 was added in very small amounts the pyruvic acid was oxidised and tissue respiration increased. Conditions which increased carbohydrate metabolism increased the need for B_1. There was no interference with succinate oxidation in the avitaminous pigeon brain. This and several other factors showed that the failure to deal with pyruvate was the important change. The work had been extended in China to human beriberi.

In higher animals there was no formation of acetaldehyde—perhaps because it might be dangerous to the organism. Acetic acid and traces of lactate were formed instead, a good deal of the pyruvic acid being burnt. In B_1 deficiency the symptoms were due to lowered vitamin content in the actively metabolising organs; the brain, heart, and kidney were chiefly affected, because their needs were greater. The phospho form was known as cocarboxylase. There seemed experimentally to be a correlation between symptoms of deficiency and the cocarboxylase content of the brain. In vitro, however, brain tissue had a very poor power of synthesising cocarboxylase, so the chain of evidence was not quite complete. The lesson to be learned was that increased carbohydrate consumption must be associated with increased vitamin-B_1 supply. An endocrine fault might produce an idiosyncrasy to B_1. Loss of weight due to thyroxine feeding might largely be prevented by giving B_1. Brain cells much depleted of the vitamin might function badly and so produce secondary changes in metabolism.

Dr. H. M. SINCLAIR (Oxford) said that two factors produced B_1 deficiency: inadequate ingestion and failure to assimilate. Laboratory work had greatly increased the understanding of beriberi. Inadequate ingestion included unbalanced diet and increased requirements due to muscular work, pregnancy, fever, hyperthyroidism, or diuresis. Beriberi had been produced simply by diets high in carbohydrate. Alcohol was a very important factor; alcoholic polyneuritis was a B_1 deficiency. Cheap spirit contained little B_1 and much carbohydrate, and the disease might come on very quickly. In pregnancy the vitamin-B_1 requirement was three times the normal and some pregnancy polyneuritis was certainly due to deficiency. Fever was so important that in the past people had thought beriberi was an infection. The diuresis might be a factor in the production of diabetic neuritis though there was little support as yet for the idea that this neuritis was a B_1 deficiency.

The vitamin might not be absorbed owing to disorder of the intestine. Cases of idiopathic hypochromic anæmia had low B_1 blood-content. Cases of pyloric stenosis not infrequently showed neuritis. Vitamin B_1 was destroyed in the gut in cases of achlorhydria. In many disorders of the intestine—in fact almost any chronic diarrhœa—beriberi had been described. Hypothetically there might be deficiency due to failure of formation of the diphospho form; the process was effected by cells of the reticulo-endothelial system, including red blood corpuscles. In cœliac disease and liver disease there might be failure of this kind. All cases of subacute combined degeneration of the cord had shown normal vitamin content in the blood. The primary reason for the low content in hypochromic anæmia was that the vitamin was almost wholly carried inside the cells; in erythroblastosis and leukæmia the content, conversely and for the same reason, was high. There might be a normal blood reading with symptoms of deficiency in cases of deficiency of riboflavin phosphate or of adrenal cortical hormone, owing to the failure to produce the phosphate form.

Dr. E. A. CARMICHAEL pointed out that there was a form of alcoholic neuritis unknown or very rare over here. American work had shown clearly that the condition was a B_1 deficiency. It was difficult to determine what other polyneurites might be similarly caused. Clinically, polyneuritis seemed to improve on A rather than B, but most of the cases had been given B_1 before being put on A.

Dr. PAUL WOOD spoke of the effect of B_1 deficiency on the cardiovascular system. The effect was not often seen but was an important one to bear in mind, because it was amenable to treatment. It should be sought in chronic alcoholics, pregnancy, cases of right ventricular failure of unknown ætiology, and patients on a long-continued restricted diet. The outstanding features were peripheral vasodilatation and right ventricular failure, producing warm skin, capillary pulsation, low diastolic blood-pressure, and pistol-shot sounds over the bounding larger arteries. The lungs were dry and the relatively short pulmonary circulation-time was associated with a high venous blood-pressure, enlargement and tenderness of the liver, and dropsy. There was a striking absence of orthopnœa. There might be an acute fulminating

form with acute circulatory collapse, hissing dyspnœa, and engorged, pulsating cervical veins. Intravenous vitamin B_1 (10–50 mg. of aneurin daily) might be given in such cases. More commonly the onset was insidious and the course chronic, and 5–10 mg. subcutaneously or by mouth would be sufficient. The diagnosis rested on the dietetic history, the associated polyneuritis, the demonstration of reduced vitamin B_1 in blood and urine, and the dramatic effects of giving the vitamin. The pyruvic acid in the blood might also be demonstrated, and Aalsmeer's adrenaline test was positive: the injection of adrenaline into the blood enhanced the symptoms. Pitressin would reduce the cardiac manifestations and constituted another test.

Mr. H. G. UNGLEY described a case of beriberi complicating pyloric stenosis. The effect of giving B_1 had been dramatic: the œdema had disappeared and the weight had fallen. Appetite had increased and calf tenderness disappeared. The arterial sounds had no longer been audible without the pressure of a cuff, and later the knee- and ankle-jerks had returned. It had been some time before the patient had shown appreciable amounts of B_1 in the blood and urine. The electrocardiogram showed right axis-deviation and an upward rise of the R–T part, with a falling R–T in lead III. The adrenaline test caused a drop of diastolic pressure to zero. Another patient had developed polyneuritis after a faulty gastro-enterostomy with gross stasis.

Dr. LUCY WILLS said that the achlorhydria of hyperthyroidism might be due to B_1 deficiency: she had not been able to cure it before operation by giving B_1, but this might be due to inadequate dosage. Animals deprived of B_1 showed neurological symptoms, even if given large quantities of B_1. It was important to remember the B_2 complex neurological syndrome.

Dr. G. L. KONSTAM spoke of two cases examined radiologically before and after treatment with B_1 and showed the diminution in the transverse diameter of the heart and the improvement in the lung fields.

Mr. A. L. BACHARACH thought that beer might contain appreciable quantities of B_1; this might account for the rarity of alcoholic polyneuritis in this country. The requirement of the normal person for health was about 2 mg. daily. A dose of less than this was hardly likely to produce effects in long-standing deficiency.

Dr. GOODHART said that in America the changes in beriberi heart disease presented various pictures. Right-sided dilatation was not necessary for the diagnosis. Doses given in treatment were often much too small; at least four times the maintenance requirement was necessary. The therapeutic dose should never be less than 5 mg. daily, and doses of 50 mg. were quite rational. Pellagra was frequent in alcohol addicts and was no longer considered to be a different disease in them from the endemic form. Patients often had more than one deficiency. The peripheral neuritis of pellagra did not respond to B_2 but did respond to B_1; it ought therefore to be removed from the list of pellagra symptoms. The skin lesions depended on environmental factors. The essential symptom of pellagra was mucous membrane lesion, such as stomatitis. The mental symptoms were of several types: gradual deterioration, encephalopathy, and Korsakoff's syndrome. If the encephalopathy could not be cured, the pellagra could not be cured. The action of nicotinic acid had yet to be proved to be a direct one; the improvement in the encephalopathy might be secondary to the improvement in mucous membranes. No one deficiency was likely to occur alone in human beings; blunderbuss vitamin therapy was quite rational. The dose of nicotinic acid for pellagra was 100 mg. or more daily.

LIVERPOOL MEDICAL INSTITUTION

A MEETING of this institution was held on Dec. 15, 1938, with Dr. E. GILBERT BARK, the president, in the chair.

Blood Tests in Cancer

Mr. M. M. DATNOW said that of the many serological tests devised in the hope of facilitating earlier diagnosis in cancer none had proved specific and some were not even accurate. Although the Vernes test was quite useful in following the course of cases under various forms of treatment, the results were sometimes hard to interpret and not all the claims of Vernes could be substantiated. Research had therefore been started with the idea of extracting from the serum the substance that gives the flocculation test. By simple extraction with acetone and ether, Dr. J. N. Parrington had obtained a pastille, and the solution obtained on dissolving this in distilled water was found to give constant and reliable results, comparing very favourably with those of the Vernes test. Mr. Datnow gave examples of the figures obtained in various conditions.

Dr. G. E. O. WILLIAMS pointed out that both with the Vernes and the pastille tests sarcomas gave low readings and carcinomas high readings. In Mr. Datnow's series a melanoma gave the highest reading of all.

Dr. ARTHUR GEMMELL thought that the results of the Vernes test in malignant disease ran parallel with those he had obtained with the Bendien test. He thought that the latter definitely foreshadowed the recurrence of malignant trouble after treatment, even before any physical signs of recurrence appeared.

Dr. CRONIN LOWE said that both the Vernes and the colloidal vanadium (Bendien) reaction depended on a complex of protein, lipoid, and inorganic plasma constituents. The variations had proved useful not only in diagnosis but (even more) in observation of progress under treatment. His own experience covered more than 3000 examinations, and referred to over 1600 cases, and though the results had not yet been tabulated, he had the impression that if a serum reaction remained positive after local excision or radiotherapy it meant that recurrence had occurred or was very probable; whereas if it became less positive or actually negative, recurrence had not so far taken place. In cases with recurrence, after negative findings, the serum reaction had previously become positive.

Dr. ROBERT KEMP said it had been shown that the Vernes, the Bendien, and the erythrocyte-sedimentation tests give closely parallel results in the same patient. All these serum tests were as yet quite non-specific. The readings were abnormal not only in cancer but in pregnancy and menstruation, in tuberculosis and syphilis, in all chronic and acute infections, and in many other conditions. The reaction depended on tissue change or damage and in general the result of the test varied with the extent of the lesion. There was so far no evidence that any of these tests could distinguish cancer from these other tissue reactions. It had, however, always been conceded that the Vernes and similar tests reflected the variation in activity of such a lesion as a malignant growth.

Pancreatic Extract in Graves's Disease

Dr. C. BAIRD MACDONALD read a paper on the treatment of exophthalmic goitre with pancreatic extract. Seven years' experience had, he said, convinced him that this remedy deserved a trial especially in early cases. The treatment had a rational basis, for in thyroid disease there was often considerable disturbance in the digestive system, with such symptoms as diarrhœa, very light-coloured stools, increased appetite and thirst. These symptoms were usually attributed to increased activity of the sympathetic nervous system, but they were more likely to be due to pancreatic insufficiency. In almost every case of Graves's disease there was some carbohydrate intolerance, and spontaneous glycosuria was often seen. Hyperthyroidism aggravated diabetes mellitus; thyroidectomy ameliorated it. The symptoms of toxic goitre disappeared after drainage of the gall-bladder in cases where there were fatty stools and other signs of pancreatic disease. Loewi's test was positive only in cases of pancreatitis and thyrotoxicosis.

The increased metabolism in Graves's disease demanded a liberal supply of fats and starches in the diet, and the oral administration of pancreatic extract must help the pancreas to break down and absorb this increased amount and thereby obtain iodine in its most assimilable form. The treatment Dr. Macdonald recommended was to give Palatinoids pancreatin grains 5 thrice daily before food, combined with Pulverettes alphidine (Oppenheimer) twice daily between meals every second or third day. Lugol's iodine minims 3 or 4 might be used instead of the alphidine. Patients should carry on if at all possible with their usual duties so as to help the mental outlook. The treatment might be successful in a few months but regular treatment had not been carried out for more than three years in any of the cases treated. Exophthalmos or goitre had very seldom increased or even developed with systematic treatment in the incipient cases.

Since 1931 the speaker had treated 42 cases of toxic goitre of varying degrees and types: there had been 21 cures and 17 were still undergoing treatment. In 3 cases the patient had died but 2 of these had suffered from the condition for eighteen years and the other had a thyroid of the large toxic adenomatous type. Of the 17 cases now under treatment all were reacting well except 1 in which there was neither personal nor environmental coöperation.

Dr. R. J. MINNITT said he had been associated with 3 cases in which this treatment had been given. They were of the incipient type. One had shown melancholic symptoms, and after a year's treatment could be looked upon as cured. The second was subject to thyrotoxic crises, and had been very much improved. In the third case the treatment had been discontinued.

Mr. PHILIP HAWE said that cases of thyrotoxicosis fall into three groups: (1) mild with fluctuation; (2) chronic with or without complications; (3) fulminating. It was clear that Dr. Macdonald did not include the fulminating cases or the chronic cases with complications as suitable for more than a short trial of his treatment. The remaining groups included those cases which no surgeon is anxious to operate on, although failure of non-surgical treatment might necessitate operation. It was of the greatest importance that cases medically treated should not be allowed to lapse into the stage of serious complications. With this proviso Dr. Macdonald's treatment should be given an extensive trial, for it appeared to offer relief in cases where operation seemed unnecessarily drastic, including especially the early mild cases.

Dr. A. E. HODGSON said that one of Dr. Macdonald's patients, a girl of 18, whilst under treatment with pancreatin, had come through his hands as a diphtheria carrier. Her tonsils had been removed by dissection, with no cardiac or other difficulty whatever.

Mr. J. B. OLDHAM said that the surgical treatment of thyrotoxicosis was an admission of failure which was only justified by its good results. He congratulated Dr. Macdonald on the successes he had obtained, but doubted if the cases he had had were of the same type or severity as those that at present came to the surgeon. A high proportion of Dr. Macdonald's successful cases appeared to have had alimentary symptoms; in these cases Mr. Oldham agreed that treatment with pancreatin produced considerable improvement and he often used it in preparing patients for operation. He (Mr. Oldham), however, had not been fortunate enough to cure any patient with Dr. Macdonald's methods. He also doubted the diagnosis in one of the cases Dr. Macdonald had presented. The patient had a normal pulse-rate but showed some tremor of the fingers, and the diagnosis had been made on the result of the impedance-angle test. Mr. Oldham had had a large experience of the test and was convinced that it was valueless.

ROYAL ACADEMY OF MEDICINE IN IRELAND

A MEETING of the section of pathology was held on Nov. 9, 1938, with Dr. R. A. Q. O'MEARA, the president, in the chair.

An Organism Simulating Diphtheria Bacillus

Dr. W. HAYES, in demonstrating *Corynebacterium ovis* isolated from the throat of a suspected diphtheria carrier, began by describing the method by which carriers were identified. A throat-swab was taken and rubbed on the surface of a potassium tellurite plate or slope. If after 48 hours' incubation it was found that suggestive black colonies had grown, one of these colonies was subcultured on a serum slope and afterwards filmed. Then if morphologically characteristic diphtheria bacilli were seen a saline suspension of the serum slope was injected into a guinea-pig. If the animal died within five days and showed characteristic post-mortem changes—the most important and constant of which was congestion of the suprarenal glands—the pathologist would report virulent diphtheria bacilli present. In the present case an organism had been isolated which fulfilled all these conditions except that it did not produce suprarenal congestion in the guinea-pig. It came from the throat of a healthy nurse, suspected of being a diphtheria carrier, and its fermentation reactions were identical with those of the diphtheria bacillus, glucose being fermented but not saccharose. It rapidly killed a guinea-pig that had been passively immunised with diphtheria antitoxin, and it was evidently a corynebacterium producing a powerful exotoxin distinct from diphtheria toxin. Besides *Corynebacterium diphtheriæ*, only two other exotoxin-producers of this genus were known—*C. pseudotuberculosis ovis* and *C. pseudotuberculosis murium*. The latter was pathogenic for mice only and fermented saccharose, and it could therefore be deduced that the organism under discussion was *C. ovis*. It differed from *C. diphtheriæ* in liquefying gelatin slowly, and again unlike the diphtheria bacillus it had been

proved pathogenic to the rat. Cultures exhibited by Dr. Hayes showed its similarity to *C. diphtheriæ* on tellurite medium, its much more profuse growth on Loeffler's serum and agar, and its rapid change to an almost coccal form on subculture. The long bacillary form became again evident however on filming serum cultures after 4–6 hours. The speaker concluded by emphasising the practical importance of careful post-mortem examination of all guinea-pigs dying after injection of organisms morphologically resembling diphtheria bacilli and the necessity of controlling doubtful results by the inoculation of guinea-pigs which had previously been immunised against diphtheria toxin.

The PRESIDENT said that the diagnosis of diphtheria in ordinary circumstances was difficult enough, without organisms of this sort turning up to make it harder. There were three types of diphtheria bacillus: the textbook type, which was a mitis type with well-marked polar staining; the intermediate type, which did not resemble the textbook type at all; and the gravis type, which was different again and was not unlike the one shown by Dr. Hayes. The necessity for virulence tests had largely disappeared, except in the case of persistent carriers, and even then they were not always necessary. If a gravis strain of diphtheria bacillus was isolated it was quite unnecessary to do a virulence test, for it was practically always virulent; and a very high proportion of intermediate type are also virulent. It was only necessary to do such a test in the case of a very persistent carrier.

Prof. J. W. BIGGER said it was important to record that the *C. ovis* might be found in the human throat, for it might cause serious administrative trouble in an institution.

The PRESIDENT of the Academy (Dr. A. R. Parsons) thought the difficulty of bacteriological diagnosis in diphtheria was as nothing compared with the difficulty of clinical diagnosis. Nowadays swabs from the throat were almost always reported as positive. He asked how the name *pseudotuberculosis* had come to be applied to *C. ovis*.

Dr. HAYES in replying said that the natural lesion in sheep was a chronic granulomatous condition, somewhat resembling tuberculosis.

REVIEWS AND NOTICES OF BOOKS

Plastic Surgery

By ARTHUR JOSEPH BARSKY, M.D., D.D.S., associate surgeon in charge of the department of reconstructive surgery, Beth Israel Hospital, New York City; adjunct professor of plastic reparative surgery, New York Polyclinic Medical School and Hospital. London: W. B. Saunders Co. 1938. Pp. 355. 26*s*.

INTO the compass of quite a small book the author has condensed a truly incredible number of recognised methods of operative repair. That nothing is lost in clarity is due to the conciseness of the text and the quality of the line drawings. Some of the photographs are open to criticism in that the before and after records are not comparable from the point of view of position or lighting. This difficulty is always liable to arise when some months intervene between the taking of the two photographs, but the problem is not insuperable. The early chapters of the book are devoted to a description of the basic methods available for tissue transplantation, and it is obvious that the author speaks with the voice of experience. One might perhaps cavil at the vagueness of the instruction to move a tubed pedicle at the end of two or three weeks, for the former time would rarely be within the limits of safety.

Next come chapters on the orbit, the nose, the ear, the lips, the cheeks, and jaws. Much space is occupied by the description of the Blair technique for the repair of a cleft lip. In the section on palatal repair the author acknowledges the contribution of Veau to this type of work but goes on to describe methods which are based mainly on Langenbeck's technique. These appear to be insufficiently drastic to effect the best possible repair in many cases. Fractures of the nasal bones and defects and deformities of the trunk and limbs are all adequately dealt with. The section on the orthopædic aspects of plastic surgery stresses the difference in outlook between this country and America, in that most of this work would here remain in the hands of the orthopædic surgeon. The fact however that this chapter demands inclusion is a grave reflection on the inefficiency of modern treatment of trauma, for most of these operations could, with better coöperation between orthopædic and plastic surgeons, be readily avoided. Throughout the whole of this book the bibliography is excellent, and the reader has little excuse for thinking the detail is meagre, since he is always referred to a comprehensive source on any subject that may be of particular interest to him.

Essentials of Materia Medica, Pharmacology and Therapeutics

(2nd ed.) By R. H. MICKS, M.D. Dubl., F.R.C.P.I., professor of pharmacology, Royal College of Surgeons in Ireland. London: J. and A. Churchill. 1938. Pp. 378. 12*s*. 6*d*.

THIS book is written from the point of view of a practising physician who confesses that he has no personal experience of experimental pharmacology, and it aims at instructing the student only about those drugs which are of real therapeutic value. It must therefore be judged rather differently from the ordinary text-books. The author obviously has a wide clinical experience and has studied the actions of drugs at the bedside. His views on many points such as the inefficiency of stimulant and liquefying expectorants will commend themselves to most clinical observers, even though they run counter to the teaching of standard text-books. The chapter on the volatile oils is commendably short and reflects accurately the relative importance of these relics of the past.

Though the present edition is much improved in this respect, it still contains statements which suggest a lack of fundamental chemical knowledge. It is amazing, for instance, to find that the citrates of sodium and potassium are still said to neutralise hydrochloric acid and to be very effective antacids. But one can forgive these lapses and a few smaller errors such as the dose of physostigmine salicylate because of the unusual number of practical suggestions. The paragraph on placebos is full of profound common sense. The book is eminently readable and is commended especially to the practitioner who wishes to bring his knowledge up to date. The medical student with one eye on possible examination questions should note its acknowledged limitations. The second edition contains references to all the important drugs recently introduced and a new chapter on antiseptics.

Leprosy

Diagnosis, Treatment and Prevention. (6th ed.) By ERNEST MUIR, M.D., F.R.C.S.E., medical secretary, British Empire Leprosy Relief Association, London. New Delhi: Indian council of the association. Pp. 192. 4*s*.

THIS book, although primarily intended for the use of doctors in India, can be read with profit by all who are interested in or have anything to do with leprosy. It is divided into three main sections dealing with diagnosis, treatment, and prevention. Diagnosis is much more likely to be accurate and treatment intelligent if the pathology of a disease is properly understood. Dr. Muir begins by setting forth his views on the essential underlying processes, linking them up with their clinical manifestations and secondary complications. Having thus laid a firm foundation he describes the clinical picture and outlines the main points of differential diagnosis. In an infective disease the finding of the causative organism sets the seal upon diagnosis and the section on the methods of demonstrating the leprosy bacillus is a model of lucidity.

Despite the value set upon drugs of the chaulmoogra series the author recognises their limitations and emphasises the need for increasing the patient's resistance by suitable diet and hygiene. The technique of the various methods of drug treatment is fully given, including local applications. This section closes with a chapter on prognosis. The third section deals with preventive measures, general hygiene, and such matters as the organisation of leprosy clinics. Appendices contain notes on subsidiary technical procedures.

It is a pity that the book is undated. An undated publication loses much of its value for reference, and can only be quoted with reservation since it is impossible to decide how adequately the author has mirrored contemporary knowledge; and this difficulty becomes greater with the passage of time. For example, the successful infection of experimental animals with the human leprosy bacillus is denied in the present edition, although the discovery of the susceptibility of the hamster was published in September, 1937.

The Nose, Ear and Throat

For Nurses and Dressers. (2nd ed.) By MICHAEL VLASTO M.B Lond., F.R.C.S., surgeon to the ear, nose and throat department, West London Hospital. London: Faber and Faber. 1938. Pp. 228. 7*s*. 6*d*.

THE title of this little book has been changed in the second edition to include dressers, for it was rightly suggested that its simplicity would make it useful to medical students with no previous experience of work in this department. The general character of the book remains the same as in the first edition published in 1926. The operation for removal of tonsils and adenoids, formerly discussed in separate sections, is now dealt with as a whole, and there is a new chapter on endoscopy. Manipulations, such as syringing the ear, which the nurse may have to carry out, are carefully described, as are the arrangement of instruments and other apparatus before operations, the duties of the nurse or dresser during operations, and the attention to be given to patients afterwards. For the removal of adherent plugging from the mastoid cavity, Mr. Vlasto recommends moistening it with dilute peroxide squeezed out from cotton-wool held by forceps, but he will find that the plug can be much more readily removed if it is wetted thoroughly with undiluted ten-volume peroxide with a dropper. The book will certainly help both nurses and dressers to perform their duties more efficiently.

Organic and Bio-Chemistry

(6th ed.) By R. H. A. PLIMMER, D.Sc., professor of chemistry in the University of London at St. Thomas's Hospital medical school. London: Longmans, Green and Co. 1938. Pp. 623. 21*s*.

WHEN it appeared in 1910 this book was one of the first, if not actually the first, in the English language to attempt to give the biological student a sufficient background in organic chemistry to enable him to proceed intelligently with practical and theoretical work. There is little doubt that it went a long way towards founding the biochemistry of today. In successive editions the book has been brought up to date, and the task of the writer of such a work becomes more and more complicated as time goes on, since the modern biologist is expected to have an increasingly intimate knowledge of advanced physical and organic chemistry. Prof. Plimmer has tackled the difficult problems with success in this volume and it can be regarded as authoritative as ever. Since it is essentially intended for advanced students, the value of the book would perhaps be increased by the addition of references.

Surgical Pathology

(4th ed.) By WILLIAM BOYD, M.D., F.R.C.P., professor of pathology, University of Toronto. London: W. B. Saunders Co. 1938. Pp. 886. 45*s*.

THIS new edition of the oldest and perhaps the best known of Prof. Boyd's popular triad is certain of a hearty welcome. Written in the author's inimitable style, it makes of pathology a pleasant study, yet manages to keep it on a strictly practical plane. The introductory chapter on surgery and pathology, which was dropped in the last edition, has happily been reinserted. The revision of the text has been thorough and has necessitated the addition of 18 new sections and the rewriting of a further 17. The new matter includes short sections on granulosa-cell tumours of the ovary, glomangioma, regional enteritis, and other recently described conditions. Most of these are well written but a few, such as those on islet tumours of the pancreas, uveo-parotid tubercle, and pilonidal sinus, are rather too brief.

There are a few small inconsistencies. Hypernephroma is described on pp. 149 and 447 as arising from adrenal tissue but on p. 440 as probably arising from the kidney itself. In the section on tumours (p. 165), adenomata of the thyroid are described as common tumours, yet on p. 223 it is pointed out that the so-called thyroid adenomata are mostly not true tumours. In both cases a critical reader would probably draw the right conclusion but it is a pity to see slips of this sort in so good a book. There is no description of the differential blood picture in carcinomatosis of the marrow, and no mention of the marble-bone disease of Albers-Schönberg.

In spite of such small imperfections this remains one of the best and most readable works on the subject, and the publishers deserve a word of praise for the excellent reproduction of the illustrations and particularly of the coloured plates.

THE LANCET

LONDON: SATURDAY, JANUARY 14, 1939

CHEMOTHERAPY IN GYNÆCOLOGY

THE last few weeks have seen the consolidation of a therapeutic revolution—the conclusion of successful clinical trials of a synthetic chemical compound which can replace a natural sex hormone to which it bears little constitutional resemblance. This result is the culmination of a full five years' work by Prof. E. C. DODDS and his collaborators in the Courtauld institute of the Middlesex Hospital and elsewhere, but their investigations have advanced at an accelerating pace in the last two years. When once it was established that the phenanthrene nucleus is not an essential component of an œstrogenically active compound, simpler substances in great variety were tested, and a summary of this phase of the work [1] includes data on no less than 126 compounds. αβ-Diphenylethane derivatives gave most encouraging results, and further inquiry in this direction was also stimulated by the report [2] that the mysterious, intensely active contaminant of the anol prepared by DODDS and LAWSON was a dimeride belonging to this series. This has just been confirmed [3] by the isolation of 4 : 4′-dihydroxy-γδ-diphenylhexane. Another highly active compound, 4 : 4′-dihydroxy-γδ-diphenyl-βδ-hexadiene ("hexadiene compound") has also been described [4] and undoubtedly more will be heard of these. Meanwhile, however, a compound with high activity in preliminary tests had been discovered [5]—namely, 4 : 4′-dihydroxy-αβ-diethylstilbene, for which the name "diethylstilbœstrol," now shortened to "stilbœstrol," was proposed. Its early promise was fulfilled in subsequent laboratory tests, in which it was found that stilbœstrol is about 2½ times as active as œstrone in the vaginal-smear assay on rats, and that its action is similar to that of œstrone on the uterus, vagina, mating reaction, and nipple of laboratory mammals, and on the feathers of capons.[6] This was followed by the demonstration of the œstrone-like action of stilbœstrol on the anterior-pituitary gland in inhibiting body-growth and the formation of gonadotropic hormone,[7] and in effects on lactation.[8] Further, it was found to be very active by mouth, and given thus it inhibited the action of progesterone, prevented implantation of the blastocysts, and interrupted established pregnancy in rabbits.[9]

The translation of these results from the laboratory to the clinic has in this country been undertaken under the auspices of the Therapeutic Trials Committee of the Medical Research Council, and the clinical results recorded last week [10] fully justify the hopes raised by the laboratory work. In one group 46 patients, and in the other group 45—all with gynæcological symptoms referable to endocrine disturbance—were treated with stilbœstrol, generally given by mouth, and it was shown that oral administration is as effective as intramuscular injection. The responses were similar to those obtained with natural hormones or their derivatives (œstrone, œstradiol, or œstradiol monobenzoate) in amenorrhœa, dysmenorrhœa, pruritus vulvæ, and menopausal conditions, including atrophic vaginitis and kraurosis vulvæ. These results are supported by reports from other workers in this country [11] and abroad.[12] The case described by ENGELHART [12] is interesting because it is a repetition, with 24 mg. of stilbœstrol instead of 140 mg. of œstrone benzoate or 35–45 mg. of œstradiol monobenzoate, of KAUFMANN'S classical experiment of producing menstruation, with typical endometrial changes, in a castrate woman by successive administration of œstrogen and progesterone. Caution in the application of a new remedy is always necessary, for obvious reasons, and stilbœstrol evidently has some toxic action, since a small proportion of patients experience nausea. While no continuing ill effects have been observed, the physiological nature of this toxic action is unknown, and until it is understood it will be well to bear in mind the possibility of injury through heavy or constant dosage. But already the gynæcologist has been given a new remedy of proved potency—a remedy cheaper and more readily administered than the natural hormone whose action it imitates.

The outcome of this remarkable series of laboratory investigations suggests that chemotherapeutic research may be turned not only in the direction of œstrogens, but also of other hormones.[13] It must however be recalled that, although a particular hormonal activity is not confined to single compounds, there are still degrees of specificity. Œstrogenic activity is a common property; male-hormone activity is less widespread; progestational activity is rare. Moreover, those who enter this field must expect much fruitless labour. The relation between chemical constitution and physiological activity is almost always obscure, and the clues capricious. It must not be taken as disparagement of the fine research done by Prof. DODDS and his colleagues if we say that their results with œstrogens have been obtained by well-directed fumbling as well as by deliberate logical steps: indeed the hackneyed simile of the skeleton key, as yet the only explanation of the activity of these artificial œstrogens, is applicable to more than one aspect of this work. A fully rational attack on chemotherapeutic problems

[1] Dodds, E. C., Lawson, W., *Proc. roy. Soc.* B, 1938, **125**, 222.
[2] Serini, A., and Steinruck, K., *Naturwiss.* 1937, **25**, 682.
[3] Campbell, N. R., Dodds, and Lawson, *Nature, Lond.* Dec. 24, 1938, p. 1121.
[4] Dodds, Golberg, L., Lawson, Robinson, R., *Ibid*, 1938, **142**, 34.
[5] Dodds, Golberg, Lawson, and Robinson, *Ibid*, 1938, **141**, 1121.
[6] Dodds, Lawson, and Noble, R. L., *Lancet*, 1938, **1**, 1389.
[7] Noble, *Ibid*, 1938, **2**, 192.
[8] Folley, S. J., and Watson, H. M. S., *Ibid*, p. 423.
[9] Parkes, A. S., Dodds, and Noble, *Brit. med. J.* 1938, **2**, 557.
[10] Winterton, W. R., and MacGregor, T. N., *Brit. med. J.* Jan. 7, 1939, p. 10; Bishop, P. M. F., Boycott, M., and Zuckerman, S., *Lancet*, Jan. 7, 1939, p. 5.
[11] Loeser, A. A., *Brit med. J.* Jan. 7, 1939, p. 13.
[12] Engelhart, E., *Wien. klin. Wschr.* Dec. 23, 1938, p. 1356; Guldberg, E., *Zbl. Gynäk.* 1938, **62**, 2584.
[13] Cf. Dodds, E. C., *Acta med. Scand.* 1938, suppl. 90, p. 141.

must await the acquisition of a "cell's-eye view." There is some factor, as yet unrecognised, which makes for physiological activity of a compound in the living cell, and which is only reflected distortedly in the formulæ we can construct or the physicochemical properties we can measure.

DERMATOMYOSITIS

ONE of the many conditions linking dermatology to internal medicine is dermatomyositis. Originally described by WAGNER [1] in 1863, its present name was suggested by UNVERRICHT [2] in 1891; but it is only within the last decade that it has attracted the interest of the general physician.

The course varies from acute to chronic. After a gradual onset (with such prodromata as transient erythema and Raynaud's phenomena) œdema, dermatitis, and non-suppurative polymyositis make their appearance. The face is commonly affected first and later the flexors of the elbows and knees, and the muscles of the buttocks, neck, and belly. In severe cases there is muscular pain, weakness, and rigidity, and occasionally deglutition and phonation are impaired. The skin overlying the affected muscles shows a peculiar heliotrope exanthem combined with œdema. The duration of this active phase varies; in chronic cases it is often followed by a period of apparent improvement, but later there are persistent skin changes, including telangiectatic erythema, pigmentation, atrophy, and sclerosis. As DOWLING and FREUDENTHAL [3] have pointed out, these changes spread from the face to the neck and scalp, to the shoulders and the extensor surfaces of the arms and forearms; and at the same time contractures develop in the affected muscles. In the active phase fever, moderate leucocytosis, and occasionally splenomegaly give support to the hypothesis that the disease is infective. Naturally enough the condition found shows minor variations; sometimes dermatitis predominates, and sometimes myositis. The case reported by Drs. HENDRY and ANDERSON in our present issue is one in which muscular weakness and rigidity were the striking features. Likewise there are all grades of severity. The general case-mortality is about 50 per cent.; some patients die in the active phase but most fall victim to intercurrent infection when the disease has become chronic. Sometimes recovery has taken place without permanent muscular or cutaneous damage (GRAY and WEBER [4]).

The nature of dermatomyositis is unknown, but opinion has favoured the notion that it is of infective origin. The histological appearances of the skin and muscle are consonant with this idea, for they show changes no more specific than focal cellular infiltration, œdema, and degeneration. In view of this ignorance the paper by Drs. SHELDON, YOUNG, and DYKE appearing on p. 82 is of particular interest. They describe the case of a boy of 17 who died after an illness lasting six months accompanied by œdema, muscular pains, and facial erythema: post-mortem examination showed a reticulosis (reticulo-endotheliosis), with lesions in the mediastinum, liver, and spleen, together with œdema of the muscles and diffuse infiltration with plasma-cells and histiocytes. SHELDON and his colleagues suggest that dermatomyositis may be a clinical manifestation of reticulosis; but it is perhaps doubtful whether this conclusion can be maintained on the evidence furnished by this one case and the two others cited. An alternative explanation is that these three patients did not suffer from dermatomyositis, *sensu stricto*, but rather from an acute reticulosis in which the muscles were affected.

[1] Wagner, E., *Arch. Heilk.* 1863, **4**, 283.
[2] Unverricht, H., *Dtsch. med. Wschr.* 1891, **17**, 41.
[3] Dowling, G. B., and Freudenthal, W., *Brit. J. Derm. Syph.* 1938, **50**, 519.
[4] Gray, A. M. H., and Weber, F. P., *Ibid*, 1924, **36**, 544.

CHILDREN FIRST

A BIG step forward in the preparation of this country to meet air attacks has been taken this week. On Monday lists were issued showing which areas are officially considered relatively dangerous and which are considered relatively safe, and the sanitary districts of England and Wales are placed in three categories: first, evacuation areas from which children (and a proportion of adults) should be removed; secondly, reception areas, to which they may suitably be transferred; and thirdly, neutral areas which need not be evacuated but should not receive refugees. On p. 121 it will be seen that all the metropolitan and many neighbouring boroughs of London come under the heading of evacuation areas, and some idea of the numbers involved will be gained from the statement that there are about a million children of school age in and around the London administrative county. The task now being undertaken by the Ministry of Health is to ascertain what accommodation for refugees is available in the reception areas, as provisionally listed.

Children, as Mr. ELLIOT says, must come first, and the Government is evidently satisfied that for the most part they will have to be put in houses at present in occupation. Local authorities are accordingly asked to survey their districts in order to ascertain what accommodation is available for school-children evacuated in school units (accompanied by a teacher) and for younger ones in charge of their mothers or someone else. The basis for the estimate will be one person per habitable room, and for each house visitors will enter in their record books the number of such rooms, the number of residents, and the number who could be accommodated on the prescribed standard. They must also note whether the home conditions are unsuitable for the reception of children or adults, whether the householder is willing to take charge of unaccompanied children, the number of additional mattresses required, and any arrangements that the householder has made for the reception of relatives or others. Householders may be told that those who do not accommodate children may be required to take other persons. Many householders would not be capable of undertaking the care of children—for instance old and infirm people living alone and those who

have to be out at work all day—and here there will clearly be plenty of opportunity for voluntary effort in looking after the children out of school hours. At farms allowance must be made for the necessity in wartime of housing additional labour in order to increase agricultural production. Local authorities are asked to make suggestions for the use of empty houses and other buildings, such as hotels and boarding-houses, which might provide accommodation for large numbers, schools being excepted. Potential or existing facilities in camps and hostels must also be noted. Should an emergency arise school-children will as far as possible be moved school by school, and will be accompanied by teachers or other helpers up to a maximum of about one per ten children. Householders will be paid 10*s*. 6*d*. a week for board and lodging where one school-child is taken, or 8*s*. 6*d*. a week for each child where there is more than one. Children under school age will be accompanied by their mother or some other responsible person. For these householders will be asked to provide lodging only, and will be paid 5*s*. a week for each adult and 3*s*. a week for each child. The Government will arrange for the necessary transport and for increased supplies at the local shops, and the Board of Education has under consideration the measures that must be taken for continuing the education of the displaced children.

The epidemiological repercussions of removing large numbers of children from cities to rural areas are difficult to foretell. There is, of course, much to be said in favour of keeping together mothers and their children of pre-school age, as well as of dispersing them as widely as possible. Accommodation in private houses seems the best way of dealing with this group. In the case of school-children, however, the situation is somewhat different. There would be great administrative advantages in providing for them fairly large-scale accommodation in camps and hostels under the care of teachers and other helpers. Also there are many small country houses that would willingly be offered and would comfortably take thirty or forty children, with three or four teachers, although on a strict count of their rooms their assignment would be much smaller. Where substantial numbers were grouped together, educational facilities could be more satisfactorily arranged, feeding would be easier, and supervision, medical and other, would be simplified. Indeed the evacuation of school-children to an area where they would be cared for in a school camp, in the neighbourhood of which the mothers and pre-school children could be billeted, would seem to be an ideal arrangement. Systematic immunisation should banish the risk of such diseases as smallpox and diphtheria, and adequate spacing of beds in dormitories would help to keep droplet infections within manageable proportions. Hospital accommodation and laboratory facilities would be a necessary part of any scheme of evacuation, and local public health staffs would have to be greatly strengthened. The concentration of children in school camps would make for the more efficient utilisation of all categories of staff.

It is easy to ask local authorities to make surveys and to promise to pay householders certain sums for every lodger received by them should an emergency arise. It is more difficult to prepare a really constructive scheme of evacuation and temporary settlement for large numbers of people. For one thing such a scheme would involve capital expenditure, and until it is recognised that air-raid precautions are just as much part of our national defence as is the provision of weapons of offence we shall not get anywhere. It is right that we should have our surveys; they are a necessary first step. But we shall need something more than that if the anxieties of the nation are to be allayed.

ANNOTATIONS

PAY-BEDS IN GENERAL WARDS

VOLUNTARY hospitals now expect in-patients to contribute towards their keep according to their means, and in 1937 about a third of the total income of the London voluntary hospitals was derived from this source. Those who can afford it are charged the full cost of their maintenance, which in London general hospitals ranges from £3 11*s*. 10*d*. a week at University College to £5 11*s*. 10*d*. at Guy's, and there is usually an income limit of about £400 a year beyond which patients are admitted only in exceptional circumstances. At Guy's forty curtained cubicles are now being reserved in the general wards for patients who can pay for their keep but whose incomes do not exceed £275 for single people, £325 for married people, and £450 for married people with children. Most wards have two cubicles and some, including the maternity ward, have four. Patients must satisfy the inquiry officer that their income does fall within these limits and must sign a statement to that effect. The charge is five guineas a week, which includes all special investigations, and there are no medical or surgical fees. For teaching purposes cubicle patients may be demonstrated to students in the same way as those in the general beds, and they must conform to the ordinary rules of the hospital, except that they are allowed visitors every evening instead of only on specified days. Those whose income exceeds the limit for the cubicles are admitted to the paying block, Nuffield House, where the minimum charge is six guineas a week and where fees are of course charged for medical attendance and investigations.

PROGESTERONE AND THE ADRENAL

ALTHOUGH in certain species pseudo-pregnancy tends to prevent adrenal insufficiency, attempts to prolong the life of adrenalectomised animals by giving them progesterone have hitherto failed. Now, Gaunt and Hays [1] report that they have succeeded in maintaining adrenalectomised ferrets for a month by injections of progesterone in doses of 0·5–5 mg. daily; the animals died when injections were discontinued. Whether the failure of previous experiments was due to inadequate dosage or whether the ferret reacts differently from other animals is still to be determined. A difference in the behaviour of

[1] Gaunt, R., and Hays, H. W., *Science*, Dec. 16, 1938, p. 576.

species is an important factor in experimental work; thus the adrenalectomised marmot dies in hypoglycæmia, but with normal values for serum sodium, chloride, and potassium. In Addison's disease, even of severe degree, menstruation may continue normally; but pregnancy is comparatively rare though it may go on to term. The history given by women patients may reveal that some features of the disease appeared in a recent pregnancy but disappeared again after parturition. This, however, suggests an added strain on the adrenals during pregnancy rather than benefit from a persistent corpus luteum. In some animals, it may be noted, the adrenal cortex hypertrophies during pregnancy.

The isolation of corticosterone from the adrenal (Reichstein,[2] Kendall[3]) and the subsequent synthesis of desoxycorticosterone (Steiger and Reichstein[4]), potent for adrenalectomised animals and in Addison's disease,[5] have some bearing on the above experiments, since both compounds are closely related chemically to progesterone. A substance having progestational effects was obtained from the adrenal gland by Engelhart[6] in 1930, the work being confirmed by Callow and Parkes in 1936.[7] Beall[8] has isolated progesterone from the adrenal cortex, and we understand that de Fremery and his collaborators have shown that desoxycorticosterone has a progesterone-like action in the rabbit. Whether the experimental work of Gaunt and Hays will have a therapeutic application is perhaps doubtful. On a basis of weight the daily dosage of progesterone required by man would be in the neighbourhood of 10–50 mg., and progesterone is even more expensive than cortin or desoxycorticosterone. The possibilities of oral therapy are suggested by the fact that chemically related compounds of progesterone are active by mouth (Miescher and Kägi[9]). The whole subject is in a fascinating phase.

NON-TROPICAL SPRUE

ALTHOUGH the main abnormality of nutrition in non-tropical sprue is the steatorrhœa, further analysis shows, according to Brull, Lambrechts, and Barac[10] of Liége, that there are multiple deficiencies in absorption of vitamins. These are not primary but possibly result from a more or less generalised deficiency of digestive secretions leading to malabsorption. The researches of these and other authors have failed to reveal the essential mechanism of any such deficiency, which must be a manifestation of deeper biological processes of which we are ignorant. That these processes are fundamental is suggested by the differences seen between closely related conditions. For example, although the anæmia associated with sprue appears very like that of pernicious anæmia and responds to similar replacement therapy, subacute combined degeneration of the cord is associated with pernicious anæmia but is almost unknown with the anæmia of sprue. Further, the prognosis of tropical sprue is relatively favourable and that of non-tropical sprue ultimately unfavourable, the tropical variety has a peculiar geographical and possibly racial distribution, and osteoporosis, which is associated with idiopathic steatorrhœa, is an uncommon development in tropical sprue. Such differences and peculiarities may depend on fundamental factors, and further research may more clearly illuminate not only these particular disorders but also the essential mechanisms of normal nutrition.

[2] Reichstein, T., *Helv. chim. Acta*, 1936, **19**, 29, and 1107.
[3] Kendall, E. C., Mason, H. L., and Myers, C. S., *Proc. Mayo Clin.* 1936, **11**, 337.
[4] Steiger, M., and Reichstein, T., *Nature, Lond.* 1937, **139**, 926.
[5] Simpson, S. L., *Lancet*, 1938, **2**, 557; see also *Lancet*, 1938, **2**, 1414.
[6] Engelhart, *Klin. Wschr.* 1930, **9**, 2114.
[7] Callow, R. K., and Parkes, A. S., *J. Physiol.* 1936, **87**, 28P.
[8] Beall, D., *Biochem. J.* December, 1938, p. 1957.
[9] Miescher, K., and Kägi, H., *Chem. & Ind.* 1938, **57**, 276.
[10] Brull, L., Lambrechts, A., and Barac, G., *Rev. belge Sci. méd.* October, 1938, p. 457.

CLIMATE AND MORTALITY IN THE U.S.A.

IN two detailed statistical studies based upon the death-rates registered in the United States in 1921–30, Herrington and Moriyama[1] have analysed the association between the mortality attributed to a number of metabolic diseases, and to certain diseases of the cardiovascular and renal systems, and the mortality attributed to various climatic and socio-economic factors. The former group comprises five causes of death—namely, diabetes mellitus, pernicious anæmia, exophthalmic goitre, Addison's disease, and leukæmia. A fairly close association has previously been observed in the United States between diabetes mortality and climate, but by appropriate correction for recognised socio-economic influences the present authors cast doubt on claims as to the rôle of climate per se in the specific ætiology of the disease. Their socio-economic factors seem to be of much greater importance and reflect the frequently observed relationship between urban prosperity and the incidence of diabetes. At the same time there is some residual relationship between diabetes mortality and lowered normal temperature and increased wind movement. This association they believe can be explained in terms of the cardiovascular complications and intercurrent respiratory infections to which the diabetic is predisposed. These secondary causes are unfavourably influenced by rigorous climates and they affect the diabetes death-rate through the precedence of diabetes in mortality tabulations. Pernicious anæmia and leukæmia also show a division of influence between climate and economic factors, in which the latter are again of predominant importance. On the other hand their rates tend to rise with prosperous rural conditions in contrast to the mainly urban associations of diabetes. Though some economic factors are likewise the dominant influence in exophthalmic goitre, with an increasing incidence in urban life, there is a considerable increase in the death-rate from this cause in cold and unstable climates. This may be the result of a stimulating climate, but the high rates come mainly, it is noted, from areas in which colloid goitre is common. The lowest degree of association with climate and economic conditions is shown by Addison's disease, which however tends to show higher rates in the colder regions. With circulatory diseases, chronic nephritis, and cerebral hæmorrhage economic factors once more predominate over the climatic. On the other hand angina pectoris is more affected by climate than by social conditions, the unfavourable environment being one which is stable but cold and damp.

From these results Herrington and Moriyama are led to reject the conclusion of C. A. Mills[2] that "a whipping up of the activity of the glands of internal secretion . . . seems to answer the question as to how weather fluctuation affects the human body." The observed association of these causes of death with climatic conditions can be largely explained, according to their results, in terms of the underlying geographical differences in social conditions; and the relatively small fraction of the total geographic

[1] Herrington, L. P., and Moriyama, I. M., *Amer. J. Hyg.* November, 1938, pp. 396 and 423.
[2] Mills, C. A., *Ibid*, 1932, **15**, 573.

variation associated with climate can also be accounted for by the direct influence of severe winter climates on the circulatory system and their association with intercurrent respiratory infections. The climatic factors found to be associated with these causes of mortality are, in fact, mainly cold and damp rather than stormy and variable influences.

LAW OF FOOD AND DRUGS

THE important new code of food and drugs law, which came into force last October, not only consolidated the old statutes but also made some by no means negligible changes. Section 6 (2), for instance, aimed at misleading advertisements, was a wise addition recommended by the Departmental Committee on the Composition and Description of Food and is specifically applied to drugs as well as food. A new book [1] by Mr. Jennings and Mr. Cole contains the text of the code and an admirable commentary. For those who have been accustomed to the enactments now superseded there are excellent notes explaining the changes. There are also judicious summaries of the case law, particularly in connexion with the sale of unsound food and the technical pleading of warranties in defence. The law relating to poisons and dangerous drugs, being outside the 1938 code, is outside the volume under review. Within its own limits the book is a reasonably complete guide for medical officers of health or others interested in this branch of public health.

This is no hack work by unemployed members of the Inns of Court. The two authors are well equipped. Mr. Cole was properly grounded in public health and local government law in Whitehall; he migrated to undertake important duties under the London County Council. The new Act, except for its provisions about markets, slaughter-houses, and cold-air stores, applies to London, and Mr. Cole has himself been added to the band of experts who officially constitute the Local Government and Public Health Consolidation Committee. Mr. Jennings is a writer of growing reputation in the field of constitutional law and local administration. He has already produced similar volumes on the two other codes (the Local Government Act of 1933 and the Public Health Act of 1936) which we owe to the indefatigable labours of the consolidation committee. Two small criticisms may be permitted. First, where a statute is divided (as is the Food and Drugs Act, 1938) into numbered parts and the draftsman occasionally mentions a part by its number, it is a convenience to have on every page of the text of the Act a shoulder-note showing "Part I," "Part II," and so on. This useful signpost has at last been provided in the King's printer's copies of statutes. Secondly, if we really must have legislation by reference even in what purports to be a self-contained code like the 1938 Act, we are not any the more easily reconciled to commentary by reference. The draftsmen members of the consolidation committee could not resist the temptation to incorporate in the 1938 Act twenty-five clauses from the Public Health Act. This saved perhaps nine pages—no great matter in a statute of nearly a hundred pages. The result is that the reader not only does not get those clauses in the book under review but is also deprived of the authors' comments thereon. It is all very well to invite him to consult Mr. Jennings's companion volume. He may feel disappointed that the book he has bought, though of the nature, substance, and quality, is not of the full quantity demanded. If this can be remedied in the next edition, we shall have little left to criticise.

[1] The Law of Food and Drugs, 1938. By W. Ivor Jennings, barrister-at-law; and G. J. Cole, parliamentary assistant, London County Council. London: Charles Knight and Co. 1938. Pp. 236. 25s.

SEBORRHŒIC DERMATITIS

ALTHOUGH the part played by bacteria in the pathogenesis of seborrhœa and seborrhœic dermatitis is still the main thesis of most lecturers on the subject, there are other factors which are likely to employ the efforts of the biochemist for a long time to come. The possible influence of vitamin deprivation, for instance, is very much in the picture. Some laboratory experiments on animals by György two years ago seemed to inculpate deficiency of vitamin-H (B_6) as the primary cause. A. V. von Kibed,[1] however, has been unable to confirm György's contention in the human subject, but he maintains that in the more severe forms of the condition the alimentary system is involved with the skin and is not in a fit state to absorb the vitamin even if it is being taken in adequate amount. He quotes case-histories to support his view that there is almost always an associated intestinal disorder with reduction or absence of gastric hydrochloric acid, and points out that as the alimentary symptoms improve the skin also tends to clear up. It follows that every case of seborrhœic dermatitis demands individual study, and that no specific therapeutic measure is likely to be discovered. Treatment should therefore be directed towards improving digestion and elimination, and will include attention to accessible foci of infection, regulation of bowel action without the use of irritating laxatives, and a digestible diet rich not only in vitamin B_6 but in all the essential vitamins. Von Kibed recommends small doses of brewer's yeast before breakfast, milk and rusks, liver in various forms, orange and lemon juice, sour milk (yoghurt), kidneys, cheese, and cod-liver oil. He has found a new preparation, Desensin, containing various vitamins and sulphur, a useful substitute for the yeast and cod-liver oil. He makes no mention of local applications, but no experienced therapeutist would withhold sulphur in lotion, paste, or ointment form, and in chronic cases ultra-violet rays, both natural and artificial, sometimes have a marvellous effect.

HORMONES AND LACTATION

A SHORT time ago it appeared that the central problem of lactation had been solved and that a special hormone made by the anterior lobe of the pituitary gland was the stimulus essential for the initiation and maintenance of milk secretion. This hormone, to which the name prolactin has been given, happens to have the property of causing growth of the crop-gland of the pigeon, and this affords a convenient method of assay. On this basis standardised lactogenic extracts are available and have even come into clinical use in a limited way. Unfortunately, however, as was shown in a review by Folley last autumn,[2] the control of lactation is not as simple as it seemed, and there has been more and more evidence that comparatively pure preparations of prolactin may be less effective than crude anterior-lobe extracts in stimulating milk secretion. Folley and Young[3] have now confirmed this finding and have also investigated the effects of various extracts upon cows in declining lactation. Single injections

[1] von Kibed, A. V., *Derm. Wschr.* Dec. 10, 1938, p. 1453.
[2] Folley, S. J., *Lancet*, 1938, **2**, 389
[3] Folley, S. J., and Young, F. G., *Proc. roy. Soc.* B. 1938, **126**, 45.

of a crude saline extract of fresh anterior-pituitary gland, and of prolactin and thyrotropic preparations prepared at low temperature from fresh gland, always increased the yield of milk considerably for five or six days, and only slight changes were found in its composition. Prolactin prepared at room temperature from commercial acetone-desiccated anterior-lobe tissue had no influence upon the yield or composition of the milk when given in doses that were equivalent to those of the fresh-gland extract as judged by the pigeon crop-gland test. On the other hand the daily injection of very large doses of prolactin prepared from dried gland led to a substantial and prolonged increase in milk volume with certain minor changes in composition. Evidently prolactin—defined strictly as the anterior-pituitary secretion that stimulates growth of the pigeon crop-gland—is not the only lactogenic substance in the hypophysis and its effects on lactation are by no means parallel with its effects on the crop-gland. Folley and Young suggest that the lactogenic activities of the extracts they used were more or less paralleled by their glycotropic activities. A thyrotropic preparation from fresh pituitary gland was found to be lactogenic in the lactating cow although it did not stimulate the growth of the pigeon crop-gland, but comparable doses of similar preparations made from dried gland did not affect milk volume or composition. From the clinical standpoint these results are somewhat disappointing, for they mean that the most efficient lactogenic extracts have other actions, of which the most worrying, with the cruder saline preparations, is a tendency to anti-insulin effects. Very likely this would be of little consequence to dairy stock, and to encourage the agricultural interests Folley and Young show that the extra milk secreted under the influence of crude saline extracts of pituitary glands could be sold for about a third more than the cost of glands used. Moreover the processes of preparation could be simplified and cheapened so that on a large scale the margin of profit would be greater.

RAPID STAINING OF RICKETTSIA WITH THIONIN

THE inability of rickettsia to grow on cell-free media deprives the bacteriologist of one of his most valuable methods of demonstrating the presence of micro-organisms. He has therefore to fall back on morphological examination and animal inoculation. For demonstrating rickettsial bodies microscopically the relatively time-consuming method of Giemsa was first used. In 1930, however, Castaneda introduced a much simpler stain consisting of a buffered and formolised solution of methylene-blue. Laigret and Auburtin [1] now find that rickettsiæ can be demonstrated quite satisfactorily by ordinary carbol-thionin, provided over-staining is avoided. A saturated solution of thionin is prepared in distilled water, and is treated with 10 per cent. caustic soda. The precipitate is collected, washed with water till neutral, and dissolved in a 2 per cent. aqueous solution of phenol. The dye can be used fresh, but it improves on keeping. Films of the material to be examined are fixed in absolute alcohol, and stained in filtered carbol-thionin for 30–50 seconds. The preparation is washed for 2–3 seconds in absolute alcohol, and then in xylol. It is examined in the usual way by an oil-immersion lens. Blood-cells are coloured bluish green. Cell nuclei are dark violet. The cytoplasm is a very pale violet. Rickettsial bodies in the cytoplasm are stained a dark violet like the nuclei. Extracellular rickettsiæ stand out clearly against the unstained background of the preparation. Numerous comparisons have been made between films stained with carbol-thionin and with Giemsa. The results with carbol-thionin have always been as good as, or better than, those with Giemsa, and in no instance have rickettsiæ been demonstrated in a Giemsa film when they were absent from a thionin film, though the reverse has sometimes been found. The simplicity of this method entitles it to further trial.

[1] Laigret, J., and Auburtin, P., *Bull. Soc. Path. exot.* 1938, **31**, 790.

PSYCHOLOGY AND PSYCHIATRY

Dr. André Repond, at the psychiatric section of the Royal Society of Medicine on Jan. 10, spoke of the profound influence on present-day psychiatry exerted by classical psychology, an essentially metaphysical part of philosophy. Even resolutely materialist schools of psychiatry still make use of old metaphysical ideas and pre-logical thinking has by no means been eliminated. The influence of modern psychology is hard to assess, because there have been so many schools and systems, each opposed to the others. Psychiatry in the past hundred years has passed through three phases, each having its own principle of research. The first was dominated by semi-philosophical psychological theories: this was especially the case in Germany. An inevitable reaction occurred at the time when the pathology of the brain began to be studied: "very soon," Dr. Repond remarked, "psychology became obsolete, the soul was nothing more, the brain everything." These views however led, by way of the discoveries in cerebral localisation, to psychological advances, chiefly associationism. Cerebral physiology, in this century, emphasised the part played by the whole nervous system (and probably the whole organism) in localised disturbances, and thereby promoted a rehabilitation of psychological theories and methods, which are now studied independently. "Better still," he added, "the functional dynamic study of the psycho-physiological personality taken as a whole has outlived the purely static anatomical conception." This he illustrated in the explanations offered for psychopathic constitution. Concurrently with the phase of cerebral pathology, independent studies in psychology and psychopathology were going on, as among the hypnotists and in the Charcot school. The third phase of development was dominated by Kraepelin. Clinical methods were used, but the investigation of psychological criteria was systematically neglected, almost banished; hence, perhaps, the failure of Kraepelin's principles of classification. More recently, under the influence of psycho-analysis, of some modern systems of philosophy, and of the progress of psychology, it looked as if the phase of clinical predominance was passing, though anatomical, genetic, and philosophical factors are at work, dividing the field as in the past. Psychiatrists, as a group, are suspicious of the philosophical attitude, and still try to solve their problems in a strictly medical, if not clinical, manner. But psychiatry is too large for this framework; and the extreme importance of its work and discoveries, with their countless repercussions in the whole field of human activity, gives it a dignity which few other sciences could claim. Psychiatrists must recognise the philosophical nature of their fundamental problems. Physicians at present get from their training a mental attitude too definitely biased towards natural science. Scientific investiga-

tion of psychological phenomena has its limits; intuitive penetration is needed too. After a brief outline of the psychological systems and methods which psychiatry can use for research, classification, prognosis, and treatment, Dr. Repond said that these systems were convergent and complementary; psycho-analysis however must be recognised as having played a larger part in clinical psychiatry than all the rest together. In the last two years psychopathological methods had suffered a setback, through the introduction of insulin treatment for schizophrenia; Dr. Repond could see useful methods and conceptions being discarded in favour of empirical (and rather brutal) treatments because the latter looked like efficient medicine.

SUDDEN DEATH

FEW things are more disconcerting to the doctor or more unfairly damaging to his professional reputation than unexpected deaths among his patients. Farber [1] discusses from the point of view of the pathologist the causes of sudden death in infants and children who were thought to be in good health or suffering from diseases in which a fatal issue was not foreseen. Congenital abnormalities of the cardiovascular system and their sequelæ are among the commonest post-mortem findings. Undiagnosed lobar pneumonia of several days' duration is sometimes found and clinicians who know how silent this disease may be in its early stages will not agree with Farber's view that these cases must have given rise to symptoms and signs which had been missed or ignored. Certain grave but correctly diagnosed diseases may terminate abruptly as a result of unpredictable catastrophes. Thus, hæmorrhage may occur in brain tumours, or hæmopericardium follow rupture of a myocardial abscess in cases of staphylococcal pyæmia. Fulminating bacteræmia occasionally causes rapid death, and Farber describes one case of suspected camphor poisoning in which death was due to influenzal meningitis. Hyperplasia of the islets of Langerhans leading to death probably from hypoglycæmia has been recorded and the possibility of a hyperactive carotid-sinus reflex—Farber quotes a suggestive case—must be borne in mind. Farber doubts whether status lymphaticus or fœtal atelectasis per se should be regarded as a sufficient cause of death. From a different angle Brisard [2] discusses the same question and cites a number of cases of sudden death in patients of various ages in whom some medical or surgical procedure, usually of a trivial nature, had been contemplated but not actually performed. He points out that had death followed the minor operation it would almost certainly have been blamed for the disaster. Moreover the doctor himself might have formed an entirely erroneous impression of the danger of the operation.

MEDICAL WORK OF THE LEAGUE OF NATIONS

THE health organisation of the League of Nations issues a number of publications of which the most important are the *Weekly Epidemiological Record*, which contains information on epidemic diseases, and the *Bulletin of the Health Organisation*, which is published six times a year and contains various technical reports prepared for the health organisation either by its expert committees or by individuals. In addition there are monthly and annual *Epidemiological Reports* and the reports of the health committee to the council of the League.

[1] Farber, S., *New Engl. J. Med.* Nov. 24, 1938, p. 836.
[2] Brisard, C., *Arch. Med. leg. Ident.* (Rio de Janeiro), 1938, 8, 1.

Although the information section of the secretariat of the League has issued various articles and pamphlets in the past, it has been felt for some time that insufficient publicity has been given to the work of the health organisation. At the meeting of the Assembly last September the French delegate proposed that further steps should be taken to meet this need. His proposal was warmly supported by Mr. R. H. Bernays, as British delegate, and the assembly of the League adopted the proposal. Accordingly on Jan. 1 there was issued the first number of the *Chronicle of the Health Organisation*, which is designed to keep informed the medical and technical press and doctors, scientists, and other people interested in the work of the health organisation. It will appear twice a month and this first number contains some five pages on the important work done by the health organisation on biological standardisation and three pages of notes on its activities during the last quarter of 1938. The latter section gives an idea of the diverse fields of activity covered and touches on such varied subjects as the recent Decennial Conference for the Revision of Nomenclature of Causes of Death, which met in Paris in October; consultations on medicosocial policy in rural areas and on health indices and rural planning, which met at Geneva; an expert committee on bilharziasis, which has submitted a report on international collaboration in this subject to the health committee; and the anti-epidemic work of the League in China.

The birth of this new publication coincides with the announcement that for reasons of economy the health section of the League is to be amalgamated with the two sections dealing with opium and with social questions. We must hope that neither the League nor its medical work will permanently suffer through the changes that are being made.

Mr. JAMES RUTHERFORD MORISON, emeritus professor of surgery in the University of Durham, died on Monday at Newcastle-on-Tyne, aged 85 years.

ACCORDING to the *Deutsche Medizinische Wochenschrift* for Jan. 6 (p. 34) the German minister for home affairs has announced that the course for medical students is to be reduced to ten half-years. This will increase the need for house appointments (Praktikantenstellen) for students who have reached the end of the curriculum. A paragraph in the *Münchener Medizinische Wochenschrift* of Dec. 9 (p. 1935) which announced that at Easter, 1939, the amount of practical work done by the medical student would be increased, that compulsory lectures on the history of medicine and on eugenics would be added to the curriculum, and that more emphasis would be laid on industrial medicine, also stated that it was hoped to replace unpaid house appointments by salaried clinical assistantships.

Mr. ALAN BREWS will deliver the second William Blair-Bell lecture at the house of the Royal College of Obstetricians and Gynæcologists, 58, Queen Anne Street, London, W.1, at 5.30 P.M. on Friday, Jan. 27. He will speak on hydatidiform mole and chorion-epithelioma.

THE LANCET Index and Title-page to Vol. II, 1938, which was completed with the issue of Dec. 31, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

THE AIR-RAID

A series of articles on medical organisation and surgical practice in air attack by
P. H. MITCHINER, C.B.E., T.D., F.R.C.S., *and* E. M. COWELL, D.S.O., T.D., F.R.C.S.

II—EFFECTS OF AIR ATTACK

A MODERN air force has squadrons of heavy bombers capable of long-range flights at a height of 20,000 ft. and at a speed of 250 or more miles per hour, carrying 2–4 tons of bombs, and of medium bombers, which are much faster, can fly at 25,000 ft., and can carry a load up to 1 ton. Composite formations of 27–36 machines—i.e., three or four squadrons—may be expected to arrive at such a height that they are almost invisible to the naked eye, even on a clear day. They can shut off their engines and approach their target under cover of clouds, swooping down with immense speed and completely surprising their victims. Repeated raids on the same locality are to be expected. In Spain the main raid often takes place perhaps an hour after the first and after the "all clear" signal has been given, when normal life is being resumed. In Barcelona two distinct types of air-raids are recognised: the "objective" raid, in which machines generally arrive at regular hours to bomb definite military targets, such as docks and barracks; and the "terror" raid, in which machines either swoop down to attack crowded streets by day or arrive suddenly at night to interrupt the civil population at their pleasures or to disturb their night's rest. Owing to the position of their base, the machines can approach from over the sea at a great height, swooping down silently on to the unsuspecting city. The first warning is often the first exploding bomb.

TYPES OF BOMBS

Three types of bomb may be used for inflicting damage on the civil population: high-explosive, incendiary, and gas. Occasionally machine-gun fire has been directed on trains or refugees crowding along roads. This is not likely to happen in this country, where a well-organised defence against low-flying aircraft exists.

High-explosive bombs vary in size from 100 to 500 lb. and are generally fitted with either a delayed-action percussion-fuse, enabling them to penetrate a tall building as far as the ground floor before exploding, or a contact-fuse bursting higher up. Occasionally bombs of 1000 kg. (= 1 ton) have been used. Some of the bombs used in Spain contain high explosive alone, whereas others contain shrapnel also. One type of bomb explodes on contact with the ground and makes a funnel-shaped pit, whose diameter and depth depend on its weight. Experts in Spain describe the following effects of bombs with delayed-action fuses:—

(1) Penetration, depending on the weight of the bomb.
(2) Explosion, the action of the fuse transforming the explosive material into gases.
(3) Destruction, spreading in a spherical manner, with the radius varying from 50 to 100 yards.
(4) Projection of fragments and shrapnel, up to 1200 yards.
(5) Blast or pressure.
(6) Suction or aspiration, following (5) and producing an even greater effect.
(7) Commotion of the ground, like an earthquake.
(8) Fire, if there are inflammable materials near.

Casualties are due to people being trapped by falling masonry or injured in the resulting fires, to blast, or to flying glass or fragments of the bomb. No protection can be provided for a building against a direct hit. Air bombs generally fall obliquely and enter the building through one of the upper storeys.

If the bomb falls in a narrow street, the blast will kill without actually wounding. Casualties are picked up dead, without apparent wounds, and only showing blood-stained fluid trickling from the mouth or nose. Post mortem the lungs are found to be torn. The effect of blast on brick buildings is momentarily to push the walls in and then to suck them out so that the entire structure comes down. In steel-frame buildings the walls are affected in the same way, leaving the floors and perhaps the upper parts still standing. The steel uprights are twisted but remain standing with the floors intact. Ferro-concrete stands up best against these effects. A bomb falling on a hard surface in an open space will scatter fragments with an effective range up to 1200 yards. The casing of the bomb bursts into small fragments, usually smaller than shell fragments. They are, however, impelled by a greater force and in consequence do vastly more damage. A fragment the size of a pea, with a minute wound of entry, will comminute a bone. A publication may shortly be issued by the British Government describing the effects of high-explosive bombs, as observed from experimental bombing of buildings from the air.

The incendiary Elektron bomb is a 2-lb. bomb with a percussion-cap and a core of thermite. It will penetrate a tiled roof and begins to burn on the first floor it meets, at a temperature of 3000° C. In a very short time, if it is left unattended, a fire is started which is difficult to extinguish. The use of incendiary bombs has been discontinued in Spain, because the buildings are resistant, the fire services are efficient, and so many of the bombs have failed to explode. One type of thermite bomb used in Spain has a ribbed band at its base which is blown off on reaching its destination, allowing the powder to escape, blaze, and splutter. It has recently been discovered that, if located immediately and covered by a fine spray of water pumped by hand from a bucket, the bomb and its immediate surroundings may be kept cool and no general fire will result. One bomber can carry a thousand 1-kg. incendiary bombs and scatter them over a belt a hundred yards wide and three miles long in about a minute. In a town half of these will probably strike buildings and start fires. A fireproof paint has recently been described which will soon be on the market.

Gas has not so far been used in Europe in air attacks. Both persistent and non-persistent gases might be used, either by being dropped in containers or as clouds sprayed from the air. Protection, however, is easier to obtain than in the case of either high-explosive or incendiary bombs. In Great Britain each person has his respirator ready, and the public is well informed on the matter. A.R.P. schemes have been prepared everywhere, and it is unlikely that panic would result.

NUMBERS OF CASUALTIES

London suffered from air-raids, carried out by German aeroplanes, from September, 1917, to May,

1918, when improved defence stopped further raids. During this period some fifty tons of high-explosive bombs were dropped, causing 1415 casualties (435 killed and 980 wounded—i.e., approximately 1 killed to 2 wounded). Analysis of statistics shows that in daylight raids there were 75 casualties per ton, as against 29 in night raids. It was found that 20–27 per cent. of the casualties were due to the defending anti-aircraft guns. Very heavy casualties have been recorded in air-raids carried out by the Japanese against the civil population in China. These are perhaps partly due to the initial absence of A.R.P., to the way in which Chinese houses are constructed, and to panic. In Shanghai one 500-kg. bomb hit a large hotel, killing 145 and wounding 200. On another occasion a short raid killed 173 and wounded 549. In other raids, we have been told, the ratio of killed to wounded has been as high as 3 to 1. After the first raid on a given city a large section of the community evacuated itself and the rest began to adopt measures of protection. Fewer casualties resulted from the next and subsequent raids, when the people had learnt what to do. No definite figures are available from Spain, and it is impossible to state the number of casualties caused by each ton of bombs dropped. Barcelona has probably suffered more than any other Spanish town from repeated air-raids. From Nov. 20, 1937, to Jan. 26, 1938, as a result of eighteen raids, 700 people were killed and 700 wounded. In March, 1938, the same city was attacked by successive raids over a period lasting three days. The resulting casualties were approximately 1000 killed and at least 3000 wounded. There were very few slightly wounded. In early December, 1938, however, the casualties were remarkably light, owing chiefly to fighting machines which intercepted and drove off the bombers.

In England and Wales and the south of Scotland any large town may be regarded as a potential target. The enemy's idea will be not only to damage armament and other factories and to paralyse essential services, but also to inflict as much damage as possible on localities where there is a densely packed civil population, terrorising everyone and inspiring panic, hoping that public opinion may force the Government to ask for peace at any price. With well-organised A.R.P. measures, however, it is possible for life to proceed almost normally, even in the face of raids continuing month after month. In Barcelona the cinemas and theatres are still open, the shops continue to trade, the streets are thronged with people enjoying the sunshine, and more children than usual attend school, owing to the influx of refugees.

Given a hostile formation of, say, thirty-six machines operating against a country with effective defences, it is unlikely that more than about twenty machines will reach their objective. Densely inhabited areas, where the population of 30,000–50,000 per square mile has not been evacuated, may expect twenty tons of high-explosive bombs in a single raid. If fifty casualties result from each ton, then a thousand casualties may result, made up of 300 killed and 700 wounded (600 lying and 100 walking). Such a raid would only last about five minutes and might occur with very little warning. It might be repeated, however, in half an hour's time or just when the "all clear" signals are being sounded. A densely populated area near important factories might therefore expect in one night 2000–3000 casualties. Larger formations will probably not be used against one objective. Simultaneous raids will undoubtedly be made, but at intervals of several miles.

The number of people injured by fire will depend on the efficiency of the fire and rescue services. Local authorities now have many auxiliary fire-engines, trailer-machines capable of pumping powerful jets of water. The pressure of water in the mains, however, will very soon be exhausted if even a few of these pumps are in action simultaneously. An alternative supply, perhaps involving pumping over long distances, must be arranged. The provision of extra open-air swimming pools in public parks or even in hospital grounds may offer one solution to this problem.

If 25 grammes of "gas" are needed per square metre, 75 tons will be required for each square mile. Reference to the accompanying table will show the number of machines required to gas London, Berlin, and Paris. The figures are given by General N. N. Golovine in the *Royal Air Force Journal*, April, 1936, and probably refer to the centres of the cities only. If an allowance of 30 per cent. is made for machines which fail to reach their objective, 8200 machines are required to gas London. No country would risk its entire air force in one attack but would always have at least 75 per cent. in reserve. An air force of such magnitude is difficult to visualise, and it would seem that on these grounds alone the total and simultaneous gassing of a capital city is impossible.

REQUISITES FOR GASSING LARGE TOWNS

Town	Area in sq. miles	Tons of gas	Number of aircraft	Number of men in crews
London ..	76	5750	5750	23,000
Berlin ..	37	2750	2750	11,000
Paris ..	27	2000	2000	8,000

PROTECTION OF HOSPITALS

The committee of the international Red Cross societies have proposed that in war certain towns or localities should be recognised as *villes sanitaires* and be immune from attack. This ideal arrangement would be very difficult to put into practice. Several reports were published by the 16th International Red Cross Conference, London, 1938, on the protection of hospital buildings by ground signs. To be visible from even 12,000 ft. the red cross must be so large that it is impossible to display an adequate sign in towns. Above 10,000 ft. the red colour of the cross is difficult to distinguish. Even if clearly marked, the hospital would not be safe from a bomb aimed at an important target anywhere in the vicinity.

Defence measures will force the bomber to fly above 12,000 ft. At this height there is a large error in accurate aiming, so that in a large town a hospital is just as likely to be hit as a gas works.

Many raids will take place at night. A complete black-out will afford the best protection. All windows must be darkened and outside directing lights and lights of ambulance cars appropriately dimmed. The darkening of windows particularly applies to the large windows of operating theatres.

The best types of buildings for use as dressing stations or hospitals in air-raids should have flat concrete roofs to resist incendiary bombs and should be of ferro-concrete or steel-frame construction with light walls. Underground bomb-proof buildings are not practicable. A survey of existing hospital buildings should now be made and both these points studied. Where tiled or slated roofs exist, care should be taken to see that ready access is provided by

ladders and trap-doors, and that the joists are either boarded over or covered by sheets of galvanised iron. This will enable the fire squads to deal with any incendiary bombs in time to prevent extensive fires. As regards the second point, undoubtedly some old buildings of brick will be very unsafe if any bombs burst in their neighbourhood. Windows may be pasted over with cellophane or paper to prevent splintering of glass. In Spain some windows are "protected" by criss-crosses of brown-paper strips. No special steps are usually taken in the hospitals. All doorways and windows on the ground floor may be protected by sandbags. Another plan is to prepare wooden frames fitted to the inside of windows. These support panels of dura-steel, which protect against the glass splinters and possibly bomb splinters also. Walls more than 2 ft. thick will keep out fragments. A bomb falling in hospital grounds will make a crater and then burst. Fragments are given an upward direction of about fifteen degrees, so that the ground floor is less likely to be damaged than the upper floors. Directly the warning of an air-raid is received, all gas, electricity, and water should be cut off at the main. Arrangements must be made to carry on with alternative or reserve supplies till the raid is over. Since this practice has been carried out in Barcelona, fewer fires have resulted in buildings actually damaged. Operating theatres and wards for serious cases should be located on the ground floor or in basements, provided the floor above is strong enough. Convalescent and walking cases may be put on the upper floors, if there is a ready means of exit on the alarm being given. Covered trenches in the hospital grounds afford the best protection for these people and the personnel not actually required to look after serious cases.

TYPES OF WOUNDS

Casualties result from falling masonry and debris, burns and poisoning from escaping coal-gas, blast effects, air-bomb fragments, machine-gun bullets, and shrapnel from anti-aircraft guns. The shrapnel ball, familiar to many surgeons in the Great War, is now replaced by two types of missile, either of which may be found as a foreign body in an air-raid casualty. One type consists of a piece of steel 2½ in. long and ½ in. deep, made so that it packs round the inside of the casing of the shell. The other is a metal disc ¼ in. thick and the size of a penny. A report has been drawn up by Dr. J. Tries, of the Barcelona Clinic Hospital, and Dr. Trueta, of the Catalan General Hospital, on the casualties resulting in air-raids from the collapse of buildings and from shrapnel. The mortality due to collapse of buildings is very high in spite of the excellent work of the rescue and demolition parties—10 per cent. of these patients die, but the figure rises to 35 per cent. if those brought in dead are included. Of persons wounded by shrapnel it is remarked that a quarter of those sustaining traumatic amputations die, and 15·6 per cent. of those with compound fractures, owing chiefly to associated lesions. Operated abdominal wounds have given a recovery-rate of 40 per cent. Of patients with chest wounds 68 per cent. die from hæmorrhage, shock, or infection. The general mortality-rate of all the wounded admitted alive to all the hospitals of Barcelona, including all the lesions from the slightest to the most serious, has been 20 per cent. If those admitted dead are included, the total figure is about 45 per cent. The report ends with a note that the last figure is necessarily approximate, for on each occasion there are dismembered limbs and sacks of fragments which are unclassifiable.

SPECIAL ARTICLES

TESTS FOR THE HEARING OF SPEECH BY DEAF PEOPLE

By Dennis Butler Fry, B.A.
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Accurate assessment of the ability of deaf people to hear the spoken word is well known to be difficult. When distances are large, errors are caused by variations in the intensity of the speaker's voice and in the background noise of the room, and by reflection from the walls, floor, and ceiling. When distances are small, reflections of sound by the patient's head cause further inaccuracies. In truth hardly any more information is obtained by any ordinary test than is conveyed by a patient's saying whether he has difficulty in hearing: (1) in theatre, lecture, or church, (2) in general conversation, (3) in conversation with one person, or (4) in conversation with one person even when the speaker's voice is raised. Similarly, if a deaf person is fitted with a hearing-aid, the most practical estimate of its benefit to him is his increase in ability to hear under the above categories the voices with which he is familiar, after a short period of trial during which he has become used to the timbre of the sound conveyed by the instrument.

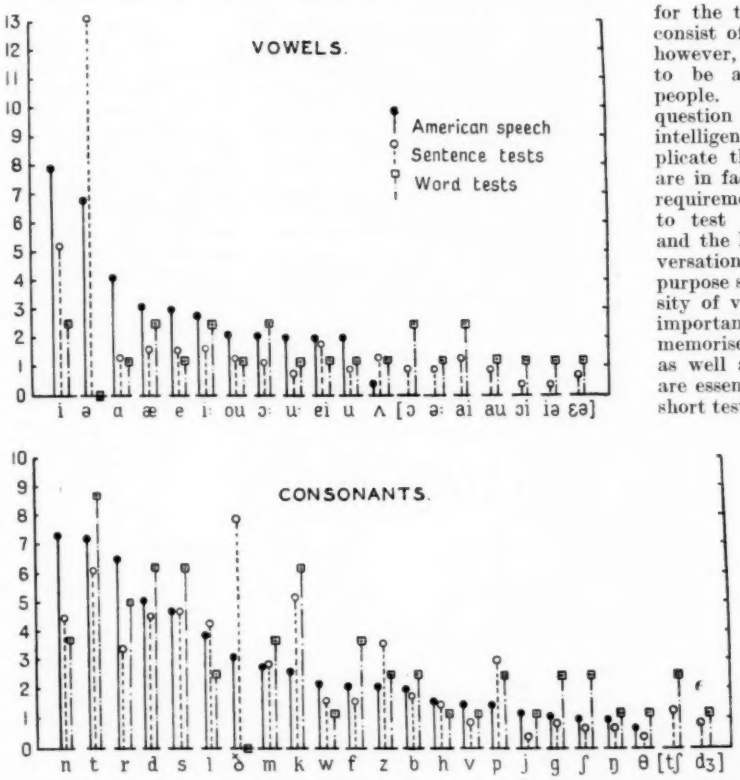
Nevertheless there are times when some sort of voice test with a more detailed measurable result is helpful, as, for example, when deciding between possible settings of a tone control on a valve amplifier hearing-aid. Such tests can also be used profitably to compare the hearing of a person at different periods, if other conditions, such as the speaker, the room, and the psychological condition of the patient, can be kept constant. It is for these occasions that the following series of tests have been devised. They have been used at the hearing-aid clinic at University College Hospital.*

FORMER TESTS

Speech tests are already in use for testing the fidelity of transmission of speech sounds through mechanical apparatus of various designs. For example in the testing of telephone apparatus, sets of nonsense syllables chosen at random are used, these sounds being spoken by trained speakers at a regulated intensity and recorded by trained listeners. A simplified version of these is used for testing the hearing of deaf people by I. R. and A. W. G. Ewing (1938). The British Broadcasting Corporation have used lists of words beginning with the same letter or group of letters to test the reception of school wireless sets.

The results of work on the transmission of speech sounds through telephone apparatus has made it clear that it is by no means necessary to hear all the

* The tests may be obtained, printed on large varnished cards, from Messrs. H. K. Lewis and Co., 136, Gower Street, London, W.C.1.



Phonetic frequency distribution count of the sounds in formal American speech, the sentence tests, and the word tests.

The phonetic symbols are those recommended by the International Phonetic Association. An explanation of these can be found in "An Outline of English Phonetics," by Daniel Jones, Cambridge, 1934, p. ix.

sounds emitted from the speaker's mouth in order to understand conversation. This is fortunate, because perfect transmission of speech sounds through any mechanical device is exceedingly difficult. Accuracy of 70–80 per cent. in transmission (as judged by nonsense syllable tests) is considered good and ample for the general intelligibility of speech; probably only about half of mechanically transmitted conversation is usually heard, although it is quite understandable, unless it contains unknown proper names or foreign words.

TYPE OF TEST RECOMMENDED FOR DEAF PEOPLE

The brain is ordinarily helped by context and custom to supply what the ear does not perceive, a process so easy that it is commonly unsuspected. This being so, although it would be ideal to measure the unalloyed hearing of a deaf person, and to give him perfect sound reproduction by means of a hearing-aid, such a measure would not be of great practical significance, and the technical imperfections of the instruments have not as serious a consequence as they might have. In ordinary life context is so valuable that some estimate of an ability to hear and guess gives a more practical assessment of functional disability or of the benefit derived from an amplifying instrument. Context was allowed to aid hearing in some tests suggested by Fletcher and Steinberg (1929) for use with inferior instruments for the transmission of speech. These consist of lists of questions, which are, however, too American in their allusions to be applied unaltered to English people. We felt that any form of question to be answered involved an intelligence factor which would complicate the issue unnecessarily. There are in fact important differences in the requirements of speech tests designed to test apparatus on the one hand, and the hearing of deaf people for conversation on the other. For the former purpose standard articulation and intensity of voice on the speakers' part are important, and tests which cannot be memorised even after frequent repetition as well as a team of trained listeners are essential. For deaf people a simple short test which takes into consideration how frequently sounds occur, as well as their variety, and a speaker with a familiar voice are more important requirements.

THE NEW TESTS

Two types of test were therefore devised; in the first are lists of monosyllabic nouns, and in the second short commonplace sentences. The former are to be used for people whose hearing is sufficient to allow them to understand isolated but common words; the latter for those people whose help from context must be considerable if they are to comprehend the meaning. The single words are nouns grouped in 5 columns of 25 and are arranged within the columns in a scientifically haphazard manner, Tippett's random sample number tables having been used for the purpose of sorting them. On account of the considerations detailed in the previous section these word tests differ in form and in the method of marking from those which have been previously suggested and used for the testing of instruments. There are 5 series of 25 sentences. One column or series is used on any one testing occasion. The alternatives are provided in case the same patient has to be tested several times, so that memory shall not play any part.

Each column of nouns contains all the sounds in the English language except ð (as *th* in breathe), a sound which does not often occur in nouns; ʒ (as *ge* in rouge) and uə (as *our* in tour), which occur rarely in English monosyllables; and ə (as *a* in about), which is unaccented and cannot occur in isolated monosyllables. The sentences contain all the sounds in the English language except ʒ and uə mentioned above.

The frequency of occurrence of these sounds is approximately the same in each column or series and (with a few exceptions) resembles the commonness of their occurrence in the English language as judged by a comparison with the data given by Voelker (1935). The latter are based on a total of 666,594 sounds in American speech; unfortunately no sound count of British speech has been published.

In the accompanying figure are shown diagrammatically the average number of occurrences of every sound in the five sentence tests, expressed as a percentage of the total number of sounds; similar data for the sounds in the word tests; and the results of Voelker's count. Voelker did not count diphthongs or compound consonant sounds, and these, together with certain sounds which do not occur in American English, have been put within brackets in the figure.

SENTENCE TESTS FOR DEAF PEOPLE

SERIES A

1. The woman sat in the park.
2. The boy did his home-work.
3. The players deal the cards.
4. The girl gets a prize.
5. Sailors part from their wives.
6. Carpenters use a chisel.
7. The servant dropped the plate.
8. The artist draws a sketch.
9. The crowd looked at the queen.
10. The stranger asked the shortest way.
11. The furniture was moved in a van.
12. The fat child cut her thumb.
13. School-children learn lessons.
14. The baker had some more bread.
15. The labourer loads the lorry.
16. Darkness frightens little children.
17. The housekeeper bought the food.
18. Hens have chicks in the spring.
19. The shepherd found the lamb.
20. The younger son joined the air force.
21. The crowd jeered at the speaker.
22. The maid took care of the clothes.
23. The bright sun thawed the snow.
24. The shopkeeper shows his goods.
25. The infant screamed with rage.

SERIES B

1. The man drank his beer.
2. The boy took his grey coat off.
3. The mother needed a lengthy rest.
4. Cars skidded on the wet roads.
5. The agent let the old house.
6. Twelve months make a year.
7. The fat man mopped his brow.
8. The teacher marks the exercises.
9. The child was shown a picture.
10. The clergyman preached a long sermon.
11. The puppy chewed the ball of string.
12. Visitors come to tea.
13. The bus turned round the corner.
14. Smokers strike matches.
15. The gardener cuts the lawn.
16. The gamblers tried their luck.
17. A stitch in times saves nine.
18. The magistrate bound her over.
19. The woman burnt the cakes.
20. The family enjoyed the play.
21. The police feared a riot.
22. Soldiers wear uniform.
23. The thief took the watch.
24. The black cat sharpened his claws.
25. The procession passed the house.

SERIES C

1. The king ruled the country.
2. The girl knitted a jumper.
3. Some farmers keep cows.
4. The men laughed at the silly film.
5. The team won the game.
6. The firemen risked their lives.
7. The better ship sailed ahead.
8. The parents kept a small car.
9. The policeman caught the burglar.
10. The passenger paid his fare.
11. Cats catch mice.
12. The butcher chopped the meat very small.
13. The mechanic oiled the wheels.
14. The mother cooked the dinner.
15. The player threw the ball hard.
16. The fire burns coal.
17. The prisoner was tried by jury.
18. The rain soaked his coat.
19. The wind shakes the leaves.
20. The cook fried the sausages.
21. Three feet make one yard.
22. The king bowed to the crowd.
23. The postman brings the letters.
24. The child stroked her pet cat.
25. The huge crowd cheered the winners.

SERIES D

1. The cat climbed the tree.
2. Old people feel the cold more.
3. The child fetched the milk.
4. The dog guards the house.
5. The customer tipped the waiter.
6. The office-boy posted four letters.
7. The scarf matches her new dress.
8. The conductor stopped the bus.
9. The driver cracked his whip.
10. The nurse pushed the pram.
11. The baby hurt his finger.
12. The clerk expected a rise.
13. The children jumped for joy.
14. The sun dried the grass.
15. Girls love jolly parties.
16. The monkey scratched his back.
17. The cook tasted the soup.
18. The train works by electricity.
19. The archbishop crowned the queen.
20. The visitors thanked their host.
21. Most men shave daily.
22. The sailor coiled the rope neatly.
23. Naughty boys tear their trousers.
24. The woman yelled for help.
25. People hear the news at nine o'clock.

SERIES E

1. The sister met her brother.
2. The girls ran a race.
3. The cook peels potatoes.
4. The dog barked at the cat.
5. The porter lifts the parcel.
6. The lady found her brown velvet coat.
7. The chauffeur parked the motor-car.
8. The newsboy stood in the street.
9. The man drives a taxi.
10. The park-keeper locked the main gate.
11. The frost burst the water-pipe.
12. The traveller packs his trunk.
13. People choose Christmas presents.
14. The bread is spread with butter and jam.
15. The maid dusted the chair.
16. The jockey rode the horse.
17. The manager raised his wages.
18. The girl shut the book.
19. The infant cried all night.
20. Father wound his watch.
21. Yeast makes bread rise.
22. The water was boiling in the kettle.
23. The jolly sailors cleared the decks.
24. The children shared the sweets cheerfully.
25. The woman threaded the needle.

WORD TESTS FOR DEAF PEOPLE

F	G	H	I	J
1. scratch	bears	dole	charm	box
2. beard	germ	part	rate	thought
3. job	nest	gin	yawn	vat
4. mouse	sheaf	choice	pairs	chairs
5. gate	king	set	trip	feet
6. chief	wood	fears	sock	girl
7. time	void	splash	thud	rook
8. thief	year	hairs	vote	town
9. shawl	cheese	risk	jet	pool
10. desk	rap	veal	spring	whip
11. noon	prize	church	fool	noise
12. fox	tide	spurt	coin	name
13. ring	chum	ride	bush	drive
14. rush	thing	rock	gout	cash
15. road	food	gang	mat	yacht
16. yard	knot	docks	mud	bed
17. fright	cord	tub	guide	fact
18. voice	shears	thorn	horse	cheers
19. pet	house	youth	fern	joke
20. ford	cart	ward	weed	hum
21. tart	rogue	crime	cheeks	harm
22. wool	tax	tomb	wing	side
23. cares	pail	gown	jeers	board
24. cat	street	fate	dash	scream
25 herd	debt	book	task	gong

The relatively common occurrence of the sounds ə and ð in the sentences is largely due to the necessity for repeating the words *a* and *the* in sentences of this simple type.

METHOD OF TESTING

Whenever possible the speaker should be someone with whose voice the deaf person is familiar—that is to say, a relative rather than the doctor. The test should be carried out in a quiet place (background noise not more than 30 phons). It is suggested that the distance between speaker and listener should be 4 or 16 ft., depending on the deafness of the patient, these distances simulating roughly the conditions involved in tête-à-tête and in general conversations. (Since the intensity of sound varies inversely as the square of the distance, the speaker's voice will be roughly twice as loud when he is 4 ft. away as it will be when he is 16 ft. away.)

It is unprofitable to attempt to find exactly how far away the spoken voice can be heard by using these or any other tests in a room of ordinary size. The differences which it is required to measure are not great enough compared with the experimental errors, as the following numbers may illustrate. The difference in loudness between the voice of a speaker 20 ft. away and the same speaker 2 ft. away is about 20 phons. The variation in intensity of a speaker with a soft voice and one with a loud voice at the same distance away is about 30 phons. Variations in the background noise of an apparently quiet room may amount to 15 phons.

In the ordinary way the patient should be made to close his eyes during the test, so that lip-reading shall not play an unsuspected part. But in some cases it is useful to estimate the combined effect of hearing, lip-reading, and guessing, and the test routine need

be varied for this purpose only by allowing the patient to look and by assuring that there is a good light on the speaker's face. The effect of lip-reading alone can be assessed if the speaker reads the test with mouth movements but without using voice.

The speaker should chat at the chosen distance, before starting the test, to give the patient confidence, to make sure that the distance is suitable, and to allow the patient to adjust the volume control of his hearing-aid, if this is in use. The patient is then asked to repeat what he hears, as the speaker reads the test slowly, item by item. The speaker should not repeat himself.

Scoring.—Four marks are allotted to each word or sentence. In the sentence test a wrong word constitutes one mistake, for which a mark is deducted, but inaccuracies regarding "the" or "a" may be ignored. In the word test one mistake consists of an error in initial, vowel, or final sound, and one mark is deducted for every fault, as in the following example :—

correct	word	thing	
repeated	„	thing	mark 4
„	„	sing	„ 3
„	„	thong	„ 3
„	„	thin	„ 3
„	„	think	„ 3
„	„	thank	„ 2
„	„	fang	„ 2
„	„	any word containing none of the correct sounds	„ 1

One mark is given even for a wrong answer, because, if the word had been heard in context, a mental correction might have been applied. If no sound had been heard, the mind could only have made an unaided guess. But any person whose total score is less than 35 per cent. on the word test should be re-tested with the sentences.

We are indebted to Miss Eileen Wilkinson for her valuable help in choosing words and counting and checking sounds.

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MEDICINE AND THE LAW

Coroner and Trade-union Official

THE Oxford coroner was clearly right when he pointed out last week that, in the absence of statutory authority, a trade-union official could not claim the right to act as advocate at an inquest. He was investigating the death of a plate-layer who was knocked down during shunting operations. Mr. J. V. Sweeney, organising secretary of the Associated Society of Locomotive Engineers, Firemen and Cleaners, informed the court that he appeared on behalf of the society. The coroner asked if he had any statutory authority which entitled him to come and act as advocate. Mr. Sweeney replied that he was present to assist the court and to ask questions on any technical point which might arise; he added that he had acted in that capacity for 21 years at courts in all parts of England and Wales and this was the first time that his right to appear had been questioned. He said he understood that the Home Secretary had given instructions that trade-union officials be allowed to attend and give assistance on technical points. The coroner said this was different to a right to sit in the court as an advocate. He refused to allow Mr. Sweeney to ask questions.

A coroner is supreme in his own court. It rests entirely in his discretion whether persons or interests shall be represented by barristers or solicitors. He does, of course, habitually allow such representation of the relatives of the deceased, if they so desire; but the fact remains that representatives have no right to address the jury or to put questions to witnesses except by the coroner's permission. Various statutes dealing with industrial accidents require the coroner to notify Government inspectors and enable him to obtain their help as his assessors. Apart from these official facilities the Factory and Workshop Act, 1891, gave a specific right to the relatives of the deceased, to the occupier of the factory and workshop, and to "any person appointed by the order in writing of the majority of the workpeople employed in the said factory and workshop" to attend and examine witnesses either in person or by his counsel, solicitor, and agent, subject nevertheless to the directions of the coroner. This provision was repealed and replaced by the consolidating Act of 1901, now itself in turn superseded. The Coal Mines Act of 1911 gave a similar right to "any association of workmen to which the deceased at the time of his death belonged or any association of employers of which the owner is a member or any association to which any official of, or workman employed in, the mine belongs." With regard to many other industrial accidents—e.g., on railways (as in the recent Oxford case) or in metalliferous mines or in the construction of engineering works—there was no specific statutory provision for the representation of relatives or trade unions at the inquest. This omission was much discussed when the Coroners (Amendment) Act was being passed in 1926. Amendments were put forward to compel all coroners to allow trade-union representatives to appear and examine witnesses. The Home Secretary successfully resisted these proposals but promised to urge coroners to follow the general practice of the majority in allowing the workers' representatives these facilities. In 1927 the Home Office carried out its promise in a coroners' circular which is printed in the latest edition of Jervis on Coroners. The covering letter conveyed a hint that, if the circular were disobeyed, the matter might have to be dealt with by a rule of procedure. In 1936 Lord Wright's committee recommended that the provisions of the 1911 Coal Mines Act should be applied *mutatis mutandis* to inquests on deaths from accidents or industrial disease in all other industries. The committee, by the way, thought that "the practice, now almost always followed, of excluding addresses to the jury, other than the coroner's summing up, should in general be maintained as being more in accord with the fact that the inquest is an investigation and not a trial." The only subsequent development to be reported is the enactment in the recent Factories Act which replaces the equivalent provision in the 1901 Act and dares at last in this connexion to make express mention of a trade union in a statute. It names the persons entitled to examine witnesses at inquests held on factory accidents. In addition to Government inspectors, relatives, and the occupiers of the factories, it includes "any person appointed in writing by any trade union, friendly society or other association of persons to which the deceased at the time of his death belonged or to which any person employed by the factory belongs," and any association of employers of which the occupier is a member.

The Wright committee's recommendations in many ways contemplated a strengthening of control over inquest proceedings. There are no parties at an inquest. There is no analogy with a trial of issues. If a large number of interested bodies had a statutory right to be represented, the committee foresaw a danger that the inquest would be converted into a form of judicial proceedings in which the inquiry into the circumstances of death would be protracted for purposes not directly affecting the issue. Relatives, employers, and insurance companies would be using the coroner's court as a process for the preliminary eliciting of evidence likely to be useful in some subsequent dispute about civil liability. In asserting his discretionary powers, the Oxford coroner may well have had in mind these considerations.

Alleged Delay Before Operation

Another recent inquest concerned the death of an infant, aged two, who had swallowed a farthing. The child was sent to a Birmingham hospital. The surgeon saw the X-ray photographs next morning at 10 o'clock and an operation was performed at 2.30 P.M. The coin was not recovered as it had gone into the bowels. The child died as the result of a collapse of the left lung. The inquest was adjourned in order to obtain a post-mortem examination. The farthing was found in the intestine. Questioned about the advisability of immediate operation, the pathologist replied that on general principles it was desirable to remove a foreign body as soon as possible, but that statement must be modified by the discretion of the surgeon as to the child's fitness for operation. The surgeon told the coroner that it was usual to give a little rest to a child who is coughing and suffering from a coin stuck in the œsophagus; there were cases where foreign bodies had been removed after days of rest. The coroner observed that it was difficult to challenge the opinion of a skilled medical man. The jury returned a verdict of death by misadventure but added a rider that there had been deplorable delay in dealing with this urgent case.

SWEDEN

(FROM AN OCCASIONAL CORRESPONDENT)

VITAMIN CONTENT OF HOSPITAL DIETS

THOUGH the medical directors of the various public hospitals in Stockholm allow themselves a certain latitude and individuality in the composition of their hospital diets, they have hitherto conformed to more or less general rules, whether the diet be for gastric ulcer, diabetes, anæmia, or nephritis. Two members of the staff of the Sabbatsberg Hospital in Stockholm, Dr. E. B. Salén and Dr. Märta Ollén-Löfgren, have recently set themselves what may prove the thankless task of studying these various diets from the angle of their vitamin content. They start with the assumption that in most diseases it is of importance to assure the patient a high, optimal vitamin standard of living. Judged by this requirement, most of the dietaries at present in vogue are found by them to be faulty. They would like to see a greater consumption of bread made from coarse-ground flour, a more liberal allowance of eggs and carrots, and more fresh vegetables whose supply could well be increased, at any rate in the summer. As for increasing the supply of vegetables in the winter without making too heavy calls on the hospital's budget, they suggest that the recent example of Berlin might well be followed in this respect. At present not only the normal or standard hospital dietary, but also certain of the special dietaries must be regarded as deficient in vitamins A, B_1, and B_2 as well as C. Suggestions are made for increasing the supply of these particular vitamins, and it is to be hoped that these would-be reformers will succeed in impressing the authorities responsible for hospital catering.

A MEDITERRANEAN HOSPITAL FOR SCANDINAVIANS

Prof. Ingvar's advocacy of the provision of a hospital on the Mediterranean for Scandinavians in general and Swedes in particular is meeting with a sympathetic response in several quarters. At present there are many Swedes who suffer from rheumatic diseases, catarrhal ailments of the respiratory tract, and various other disorders, and who would profit greatly from residence in a subtropical climate if only they could be sure of proper medical care in congenial surroundings. Prof. Ingvar has quoted in this connexion the remarkable observation of Coburn, of the Presbyterian Hospital in New York, who transferred 10 cases of severe and progressive rheumatic fever to Porto Rico where a dramatic recovery was effected. He draws attention to the difficulties at present awaiting the Swedish patient wishing to follow the example of Coburn's patients. The Swede would not know where to go and from mere dread of a voyage to the unknown would remain at home when, with a little encouragement and the knowledge that a Swedish hospital awaited him, he would gladly make the venture. It should be noted that hospital construction costs less on the shores of the Mediterranean than it does in Sweden, and that once the expenses of the journey were defrayed, the cost of hospital treatment would also be less than in Sweden. Prof. Ingvar contemplates the provision of a hospital with 50 or 60 beds, but if the other Scandinavian countries were to coöperate, it might well be that double this number of beds would be needed.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

EUGENIC PROBLEMS FOR DERMATOLOGISTS

IN one of a series of lectures now being given to the National Association of Magyar Physicians on anthropology and heredity, Prof. Edward Neuber drew attention to the many tasks awaiting dermatologists in the field of eugenics. He suggested that doctors who do not deal with either dermatology or eugenics may help in the work by preparing exact genealogical trees of their patients and submitting them to eugenic experts. As it is beyond our power directly to influence the germ plasm either parakinetically or still less idiokinetically, we can only try to guide the process of selection in a favourable direction by social and political measures. We can influence selection by widespread educational work; youth must be told about the achievements of heredity that rest on a solid basis of racial biological research. The family spirit and reverence for ancestors form a firm foundation for proper selection, and education may do much to encourage them.

In dermatological practice the process of natural selection is often seen in action, for individuals afflicted with ugly skin diseases fall out from the propagation of the race. Everything possible ought to be done to prevent the introduction of venereal diseases into a family because they cause serious damage to the biological constitution of people. In Prof. Neuber's view it is not enough to enlighten

young people and teach them sexual hygiene; it is imperative that they should be periodically and systematically examined, as is already done in some western countries and in some Hungarian towns. Besides this it is urgently necessary to introduce effective venereal laws, to bridle prostitution, and to make notification and treatment of venereal patients compulsory. Finally it is necessary to introduce compulsory ante-marriage examination and advice.

RABIES FROM PORK

In a village in Rumania some weeks ago a mad dog bit a pig belonging to a smallholder. The owner duly buried the pig outside the village, but some gipsies camping in the neighbourhood exhumed the corpse and feasted on the free pork. From 8 to 10 days after the banquet one after the other fell ill, and the district physician established the diagnosis of rabies. Three of the gypsies died in terrible pain, while the rest have been sent to the Pasteur Institute at Cluj.

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

THE inauguration of the Royal Australasian College of Physicians at Sydney on Dec. 13 constitutes an important landmark in the history of Australasian medicine. The decision to form an Association of Physicians of Australasia was made in June, 1930, at a meeting of physicians in Melbourne. Sir Richard Stawell was elected chairman, and it was decided to limit the association to not more than 75 members, who were to be physicians actively engaged in teaching. The possibility of forming a college of physicians was vaguely mooted at this time but the first definite proposals were submitted to a general meeting of the association held in Melbourne in May, 1936. This meeting decided that the time was ripe for the formation of a college to be modelled on the Royal College of London.

A committee was appointed to draw up a constitution and this was approved by the association in October, 1936. The Association of Physicians now became the College of Physicians, the members of the association becoming the foundation fellows of the College. Sir Charles Bickerton Blackburn became the first president.

The next steps were to find suitable premises to house the College and to seek legal incorporation. As the headquarters of the Royal Australasian College of Surgeons were in Melbourne, it was decided that those of the College of Physicians should be in Sydney. The New South Wales government contributed £25,000 towards the building fund, and this was augmented by a donation of £15,000 from the late George and A. M. Nicholas of Melbourne, and a sum of over £60,000 from public subscriptions. The property known as the Warrigal Club, in Macquarie Street, was purchased for £23,000 and this building is to be altered so as to provide a lecture hall seating two hundred people, examination rooms, library, offices, and so on. The College was legally incorporated as a public company and the King graciously gave his assent to the use of the title "Royal." Negotiations are now in progress to obtain a royal charter.

The functions of the College will be complementary to those of the universities and the British Medical Association. It will not at present engage in systematic teaching, although it may advise regarding courses of study, and will grant a higher qualification in medicine on the lines of the M.R.C.P.

The inauguration ceremonies extended over three days and were attended by about 150 physicians from all parts of Australia and New Zealand. The Royal Colleges of London and Edinburgh were represented by Dr. Morley Fletcher and Prof. C. G. Lambie, and the American College by Dr. Noble Wiley Jones. The inauguration was carried out by Lord Wakehurst, the Governor of New South Wales, in the great hall of Sydney University. On behalf of the Royal College of Physicians of London Dr. Morley Fletcher presented the College with a caduceus and morocco-bound copies of Munk's roll and of Harvey's original notes on "De Motu Cordis." Dr. Morley Fletcher and Dr. Noble Wiley Jones were admitted as the first honorary fellows.

AUSTRALIAN AND NEW ZEALAND ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The twenty-fourth meeting of this association is being held at Canberra from Jan. 11 to 18. About a thousand fellows, members, and associates are expected to take part in the discussions. There will be many official overseas guests including Mr. H. G. Wells, and Prof. N. V. Sidgwick of Oxford. The congress will be divided into 16 sections including zoology, anthropology, medical science and national health, and physiology. In the anthropology section the Australian aborigine and the social anthropology of Oceania (New Guinea, and Melanesia and Polynesia)

The Royal Australasian College of Physicians.

will be discussed. The section on medical science and national health will deal particularly with physical education in relation to national fitness. Attention will also be given to child development as promoted by the facilities for child and parent education in nursery schools. The principles and technique of public education will also be the subject of a demonstration. Following the lead of the British Association at the recent Cambridge meeting, time has been set aside for discussion on the relation of science to society, and the social consequences and possibilities of science.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A PHYSIOLOGIST IN AMERICA

II

Sept. 4.—On Thursday night, at 10 P.M., I set off from Woods Hole for a day in New Haven. The booking-clerk very kindly dissuaded me from wasting five dollars on a sleeper, so I bought an ordinary ticket. No English booking-clerk would have presumed or bothered to give unasked advice—to an Englishman, anyhow. I wonder how many interesting discoveries we should make about our own countrymen by pretending to be American.

Deposited at 4.10 A.M., the only passenger, at New Haven . . . just like any other place at this time of day. Dark and cold; odd trams and occasional newspaper boys and the usual unconvincing been-up-all-night cheerfulness of the brightly lit refreshment-room at the station. . . . At dawn, proceeded to explore and felt definite signs of returning consciousness on seeing a gallon can of Chewing Gum Remover in a shop window. Several Americans have expressed incredulity about this, possibly on the grounds that the claim implied by the label is exaggerated, but I refuse to admit any doubts about the accuracy of the observation. Felt even better on passing a fully armoured car labelled "Commercial Vehicle," and after a preliminary survey of the outside of a few apartment houses, had a fantastically expensive shave and an excellent breakfast. The average hairdresser here charges fifty cents for a haircut but does the job better; you pay extra for brilliantine.

In full daylight New Haven looked rather attractive and had no skyline of skyscrapers, which I had of course expected. But it didn't look exactly English. The main streets were neither gloomy nor imposing, qualities either singly or together inseparable from our manufacturing centres, yet the place was obviously too large and too modern for an English country town. In the middle was an enormous green space, something like the Stray at Harrogate, though not quite so large, with three churches in the middle and a sprinkling of trees. This was so definitely pleasant and surprising that I sat on a seat and watched life go by for a bit. It was already getting warm.

At 9.30 I entered the palatial hall of the medical school and asked the goddess enthroned in the centre of its very polished interior if my future chief was about . . . he promptly readjusted his whole morning, took me for an hour's drive round the university and the charming residential parts of the town, and then turned me over to a recently arrived member of the department for a bit of house-hunting, on the principle that his own effort in that direction was still fresh in his mind.

In and out of apartment houses till I was dizzy. Most of them had deaf, absent, or indifferent janitors, and we spent a lot of time just standing about pushing bells . . . back to the medical school, limp and perspiring, for lunch. Gloomy visions of future domestic crises and inevitable bankruptcy. . . . Further investigation of addresses supplied by the university. . . . Someone reasonable at last—gas, electricity, heating, telephone thrown in. Sheets and spoons available. Cheers. The lady of the house, originally from Boston, recognised a gentleman when she saw one, spurned the idea of a written agreement and waived the matter of a deposit. We parted on a highly moral note as she confided her reasons for turning away a young lady applicant the previous day. Feeling, not without gratification, like the Englishman whose Word is his Bond, I promised not to look at any more apartments and staggered thankfully into a 'bus—and out again as quickly as I could. I had forgotten to look at the local school. After a lot of fruitless knocking and exploring I found an Irish caretaker in the basement who conducted me round a charming little kindergarten and promised to tell the teacher to expect Marjorie next week. No social stigma attaches to the public elementary school; you pick the district you feel like living in, and the problem of education solves itself.

Mounted the station 'bus in real earnest this time, and sat back with a sense of duty well done. Began to appreciate our future surroundings. The road was very wide and flanked on each side by a broad grass verge on which grew towering elm trees at regular intervals as far as the eye could see. After that came the sidewalk ("pavement" in this country refers to the road), and then the lawns of the houses, most of these being of the large "colonial" variety. I read somewhere in a paper or magazine before leaving home that we could achieve an air of spaciousness out of all proportion to the actual area involved by sacrificing the hedges and fences of our front gardens. It would, of course, be sheer waste of time to support any such movement at home, but the statement itself is strikingly and impressively true, and my own previous convictions on the matter are more than a little shaken. Magnificent is the only word to describe this avenue, and its lay-out is typical of almost any residential street in the city. In fact, I am told that the arrangement is more or less standard everywhere.

* * *

Sept. 14.—New Haven. This morning we all went into town and I showed Stelia as much as I could. We took Marjorie to the "board of health" where a doctor glanced at her throat from a distance of several yards, asked if she had been vaccinated and passed her as fit for school. This afternoon she started at the kindergarten and enjoyed it. They did sewing and singing and resting, and one little girl smiled at her . . .

Sept. 16.—First dinner at home for two months. Lamb cutlets, green peas, potatoes, and (canned) beer, followed by bilberries, of which there is a profusion here. Not an exciting menu when committed to paper, but a banquet when viewed down a long vista of corncobs, squash, tinned pears with salad

dressing, salads in endless variety, sweet buns and butter, ice-cream and tea. Tea is a gesture rather than a drink here. The first time we ordered it and were presented with cups of warm water, we were pleasantly surprised. Ah, we thought, they have detected by our accent that we are English; they have heard how important is the warming of the pot, and they are also warming the cups. Alas! as anticipation gave way to impatience and impatience to doubt, we observed with horror a piece of string in each saucer. At one end was a yellow label, bearing the name of a well-known yachtsman, at the other—I can scarcely bring myself to write it—at the other was a muslin bag, containing tea. It is painful and hardly decent to describe the conventional procedure, but we complied with custom and ever after drank coffee when possible. For some reason, good coffee just makes itself here, as good tea does in England: it is impossible to make poor coffee, much to Stella's delight.

But *revenons à nos moutons*. Dinner on this side of the Atlantic is not easy, though it exhibits varying degrees of severity and we have experienced it once or twice in what is to us its normal manifestation. In its most acutely embarrassing form, it appears as, say, roast beef and one veg. on a central plate, surrounded by a semicircle of lesser dishes, bearing salad (possibly lettuce, pineapple, and mayonnaise), veg. number two, a hot sweet currant bun with butter and jam, and coffee. This may be preceded by soup or hors-d'œuvre and is followed by a cigarette and ice-cream. Coffee is usually postponed till the very end in private homes. But the state of dilemma introduced by the main course cannot be good for the digestion. So far as we can tell, all the dishes are to be tackled simultaneously. More difficult still, unilateral disarmament is the almost universal custom. The knife is banished without delay to the far side of the plate, pointing west-north-west, and the fork is transferred to the right hand. Now I am pretty good with a fork. I can eat a meringue and cream with one single-handed. But in spite of this not inconsiderable prowess, lettuce defeated me. I challenge any Englishman to put a lettuce leaf on a plate, place the plate well to his left, and then to cut, pick up, and eat that leaf cleanly with a fork held in the right hand. It was very gratifying to find that our dexterity in being able to eat with both hands was genuinely admired.

And what of the stuff we teach our students? The importance of good cooking—well, that can stand. Inferior cooking is unknown in the United States. But are there not perfectly good, nay, classical reasons why the courses should follow each other in their appointed order? Do we not distinguish between sweet and savoury? Perhaps, but one grows cynical. I have seen an obviously healthy and presumably innocent maiden breakfasting with gusto off hot muffin, butter, strawberry jam, and smoked haddock. Why not? It is all a matter of taste. Valerian is said to have been a popular Elizabethan perfume, and perhaps our customs are not, after all, laws of nature.

* * *

Sept. 17.—Spent the evening exploring the university and finding it ever more beautiful. The prevailing type of architecture is Gothic, but there are one or two perfect Georgian quadrangles. One of these is designed to shock the purist, for that side of its buildings which faces the street is Gothic. But since one cannot see both inside and outside at the same moment I cannot work up any indignation about it. The buildings are really beautiful and enclose charming courts in which have been transplanted trees of considerable age. The illusion of maturity is repeated in the walls, which are made to look as though they have fallen down and been restored. Stone merges gradually and irregularly into brick, and even the purely stone parts are varied so as to give a pleasing mixture of tones. In other places a few stones are arranged so as to simulate part of the top of an arch which has become incorporated in the general structure, and on many walls are complete arches "bricked in." All this has been done so skilfully as not to be noticeable at first, and it has a very "settling" effect, for if these buildings looked as new as they really are the blank walls would be distracting. Arches and towers and other places suitable for gargoyles are decorated in medieval style, though the faces and figures are of contemporary significance. The gymnasium is a hypertrophied parish church and the library a vast cathedral—almost literally. Amusing? Perhaps. But beauty and dignity are combined with utility, and reading is actually encouraged. Does it matter that it is impossible to walk up the "nave" with a hat on and that books are exchanged at the "altar"? One tower, the Harkness memorial, is particularly beautiful; I must find out what it is used for, if for anything. It is said to have been modelled on Boston Stump. In the brief twilight we felt that the colleges of the University of London were mere institutions and that Oxford was a poor relation. A bit unfair to Oxford perhaps. We finished our walk as it grew dark, with a full moon coming up over the turrets of the colleges and the silence broken only by a carillon chiming the Old Hundredth.

* * *

Nov. 9.—On Saturday we saw our first "football" match. Incredible to watch for the first time, but not so difficult to describe afterwards now that the shock has worn off. The ball is placed on the site of the last casualty, and one team lines up behind it in a series of alert attitudes, while the other stands with heads together and the captain whispers "Abracadabra"—several times, I think, for this collective breech presentation lasts a long time. Eventually they straighten up and deploy in front of the ball which the man in the centre now flips backwards between his legs. The ball disappears as if by magic, and a brief free fight ensues, after which the whole process is repeated ad nauseam. If the team with the ball doesn't advance ten yards in four "plays" (and it never does) the ball is given to the other side. The clock is stopped while no actual fighting is in progress, and on Saturday the first thirty minutes of the game took exactly one hour. There are nearly as many referees as players, mostly engaged in taking the latitude and longitude of the place where the man last with the ball has been assassinated. This is time-consuming, for quite often at least two piles of players have to be disentangled before it can be ascertained which conceals the ball. It is the duty of certain unfortunates to pretend they have it, thereby creating diversions and risking their lives for the cause. Owing to the number of bulges already existing in the extraordinary costume affected by the players, it is quite difficult to be certain whether or not a football is concealed about their person.

Another individual I felt sorry for was one whose duty it seemed to be to run as hard as he could for a certain distance and then cast himself to the ground. On one occasion he got the ball and there was no one within a mile of him. It was obviously a mistake. He stood still in his tracks looking in a bewildered fashion

up and down the pitch till the opposing side galloped up and felled him. Now and again the game is stopped (and the clock) while the supporters of either side wheel on an ice-cream wagon from which the players refresh themselves. It probably contains vodka. Along the side of the pitch are a number of enthusiasm-mongers who exhort the crowd and probably feel rather foolish. Half-time lasts for fifteen minutes during which two enormous bands appear, belonging to the respective sides, and play in turn. The opposing band forms itself into a Y and everybody cheers. Later, our band adopts the appropriate complementary formation and everybody cheers again. At each side of the pitch in the centre is a rectangle of helmets (we thought at first they were skulls), and new players are sent in to replace those who retire. Curiously enough the game sounds most interesting and exciting over the radio. We left three-quarters of the way through, but didn't get home in time to hear the result.

Nov. 23.—Weather getting colder. Put on my tweed suit the other day, still rather new and fluffy. Accosted enthusiastically in the street by a perfect stranger: "Boy!" he said, "I like your pants" . . .

RADIUM TREATMENT AND RESEARCH IN MANCHESTER

ON Wednesday last Mr. F. P. Nathan, chairman of the board, opened a new private patients' home at the Christie Hospital and Holt Radium Institute, Manchester, and on the same day Dr. S. Mewburn Brown opened the new Southport laboratory at the institute, a gift from the people of Southport.

Nathan House has been built to meet the increased demand for private beds. Medical practitioners throughout the large area served by the Christie Hospital—which extends as far north as Carlisle, east to the borders of Yorkshire, and south to Wales—have become accustomed to the services offered for diagnosis, treatment, and follow-up of cases of cancer in hospital patients. Similar facilities are naturally desired for private patients, and the 12 small private wards within the original building have not sufficed for the numbers applying for treatment.

The new wing provides accommodation for 30 private or semi-private patients, and is conveniently placed for access to the operating-theatres and to the X-ray therapy and diagnostic departments. The resources of the Radium Institute for the construction of radium applicators and of "beam direction" apparatus, and the "lead collar" which is used instead of the more usual type of radium "bomb," will all be available for the treatment of these private patients.

The building contains two stories with single wards for fully private patients on the first floor, and wards with 1–3 beds for semi-private patients on the ground floor. The rooms here open by french windows on to a verandah leading to a garden, and the upper floor also has access to a roof garden.

Several features are probably new to English hospitals. On each floor there is a central bay from which the sister in charge can see and be seen by everyone who enters the main passage of the building, and can at the same time maintain direct electric communication with each room. There is also a portable "buzzer" which the nurse who has to work in different rooms carries with her, so that any of her patients can summon her at once in case of need. Special wall heating, an automatic emergency lighting scheme, an arrangement for ensuring privacy without locking doors, and silencers on all doors are other advances in equipment. There is ample bathroom accommodation, several rooms having private baths. Each floor has a wireless and telephone installation, and a sitting-room for patients well enough to sit up. There is a special kitchen on the upper floor.

The new laboratories are specially equipped for research into the effects of radiation—work which is directly connected with radiation therapy, but for which biological test material must be provided. The suite consists of four laboratories, with a possibility of adding a fifth. All are fully equipped, and compressed air, vacuum, steam, gas, electricity, and water are all laid on at points placed in convenient positions on each bench. The main biological material is tissue culture, which offers an excellent medium for investigation of the action of X rays and radium. Two laboratories and two air-conditioned dust-proof cubicles for culturing in aseptic conditions are provided, with special incubators. New apparatus for the roller-tube method described by Dr. George Gey of Baltimore is being constructed, and a Cine Kodak is used to obtain moving pictures. In the biochemical laboratory modern apparatus is available for the investigation of the effects of radiation on enzymes, and on cell metabolism as measured by Warburg's method or by the specific-gravity method of the cartesian diver. A damped precision balance and modern apparatus for dialysis and for water distillation in glass are installed, and further facilities will be added as work proceeds and as funds become available. The last laboratory is specially arranged for hæmatological investigation, and here the research is also clinical because much radiation treatment is controlled by regular blood-counts. There are

A private room at the Christie Hospital.

many interesting changes in the blood which are not yet fully known, and full-time investigation is expected to produce important data for statistical analysis.

The doses used for treating the biological test materials are all calculated with the coöperation of the physicist to the hospital, and a research-worker with special qualifications has been appointed to correlate the experimental findings with the clinical reactions seen in patients under treatment.

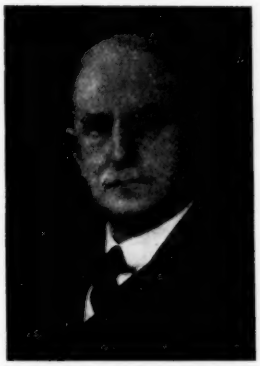
OBITUARY

ERNEST BLECHYNDEN WAGGETT

C.B.E., D.S.O., M.B. CAMB.

Major Ernest Waggett, who died on Jan. 5 at the age of 72, was one of the pioneers of otolaryngology. He was the son of Dr. John Waggett, a Kensington general practitioner, and was educated at Charterhouse and Cambridge University, gaining first-class honours in the natural sciences tripos. He went on to St. Bartholomew's Hospital in 1890.

After various house appointments Waggett became pathologist to the London Throat Hospital in 1893 and assistant surgeon in 1896. His next appointment was as surgeon to the throat department at the Royal Northern Hospital, and in 1905, when Charing Cross Hospital decided to appoint specialists to take charge of their special departments, Waggett was invited to take over the ear, nose and throat department there. His hospital patients were his first consideration, and he never allowed personal factors to interfere with his ideal of doing his utmost for them. More than once he postponed his annual holiday to stand by a hospital patient who was critically ill. When Charing Cross was in debt and unable to afford special equipment, instruments, or even special diet, Waggett provided them at his own expense.



[Lafayette

Ernest Waggett was gazetted lieutenant in the R.A.M.C. (volunteers) in 1898 and continued in the new Territorial Force when it was formed in 1908, being promoted major in 1910. At the outbreak of the late war he was mobilised with his unit and served with the 85th Field Ambulance in Flanders and later in Salonica until the armistice. He was mentioned three times in dispatches and awarded the D.S.O. Since the war he has been president of the laryngological section of the Royal Society of Medicine and of the throat and ear section of the British Medical Association. For seventeen years he was throat specialist to the Queen Alexandra Military Hospital, Millbank. He was made C.B.E. in 1931. Waggett wrote a number of articles on his specialty in the medical journals and was the author of the section on bronchoscopy in Allbutt's "System of Medicine," of the article on foreign bodies in the throat in Hutchison's "Index of Treatment," and of a "Handbook of the Diseases of the Nose."

"His professional ideals were very high," writes E. D. D. D., "and his downright, straightforward decisions, devoid of self-interest, commanded the admiration of all who came in contact with him. Waggett had a flair for encouraging and helping his junior colleagues, and was always interested in their careers. In his professional work he displayed considerable originality and ingenuity and was ready to give any promising new instrument or treatment a trial. For example, when Killian and Brüning were designing instruments for bronchoscopy and œsophagoscopy in 1906, Waggett went to Freiburg and brought back a complete set of these instruments and was one of the first in this country to use them. A few years before 1914, Waggett maintained that if war came Germany would attempt to land an army on the east coast, and that if the landing was successful we should not be able to prevent that army reaching London. Consequently, he spent much of his spare time making maps and plans for the medical service in such an event. In 1913 he was a strong advocate of universal military service, and in public speeches and articles outlined a scheme by which young men over eighteen should be compelled to serve in the territorial army for three years. He received no support from official circles and his scheme was dropped. Some years ago both his legs were amputated above the knees but he refused to be an invalid and bravely and cheerfully carried on his many interests. He insisted on seeing some of his old patients; he attended committee meetings, and was often seen in his chair at council meetings of Charing Cross Hospital. The loss of his legs gave him more time to pursue his favourite hobby of sketching and pastel work, and many of his pictures received high praise. He was indeed a great gentleman, and the many friends and associates who came under the spell of his charm will not forget him."

In 1893 Major Waggett married Constance, widow of George Maule Allen. His wife and one daughter survive him.

THOMAS WINGATE TODD

M.B. MANC., F.R.C.S.

Prof. Wingate Todd, who occupied the chair of anatomy at Western Reserve University, Cleveland, Ohio, for twenty-six years, died on Dec. 29 at the age of 53. He will chiefly be remembered for his contributions to anthropology, for his study of the bony changes in growing children, and for the vast osteological collection he made at the Hamann museum at Cleveland.

Wingate Todd was born in Sheffield in 1885, the son of James Todd, a Methodist minister, and he studied medicine at Manchester University and the London Hospital. He gained first-class honours in his M.B. in 1907, and after holding house appointments at the Royal Infirmary became lecturer in anatomy at Manchester University in 1910. In the short time that he held this post he showed the untiring energy that was his permanent characteristic, and with the encouragement of Elliot Smith did valuable work on the morphology of the brachial plexus and the symptoms caused by cervical ribs. In 1912, at the age of 28, he was appointed to the professorship at Cleveland. There he set himself the task of placing on a scientific basis our knowledge of the effects of age, sex, and race on the development of the human skeleton. His research, based on the examination of between three and four thousand

skeletons, has made it possible to tell the age of any given skeleton with comparative certainty. He inquired also into the influence of mental states on the motility of the alimentary tract, and gave an account of his findings in his Beaumont lectures in 1930. In the last ten years he turned to the problem of the development of the bones in childhood, making radiographic examinations of 800 children regularly four times a year in order to establish a standard of normal ossification at different ages. A year ago he published the first volume of his "Atlas of Skeletal Maturation," dealing with the ossification of the hand, and this was to be followed by similar volumes on the other parts of the body.

Todd was a man of boundless and infectious enthusiasm. He possessed great physical and mental stamina and could drive himself at top pressure from early morning to far into the night and do with little sleep without apparent fatigue. In spite of this he was no slave-driver to his subordinates, and would take endless pains with the difficulties of his students. His interests extended beyond the limits of his own subject into the realms of literature and art. In 1912 he married Eleanor Pearson of Manchester, and they had two sons and a daughter.

PROSPER ST. LEGER LISTON

L.R.C.P.I.

Dr. Liston of Bourton-on-the-Water died very suddenly while visiting a patient on Jan. 2. He belonged to the type of country practitioner who is regarded as a friend and adviser in realms beyond those of professional work. His kindness, and his interest in social services, also accounted for the high place he held in the affection and respect of those for whom he worked.

Liston was a student of Trinity College, Dublin, and of the Irish Colleges of Physicians and Surgeons, where he was awarded gold medals in medicine and surgery. After qualifying in 1893 he practised in Ireland, and, like many of his countrymen, his sporting instincts led to his being both a hunting man, with the Meath hounds, and a polo player. After a serious illness he moved to Cornwall for five years and in 1908 he went to Penang, where he worked as a general practitioner until he returned to England in 1917 to join the R.A.M.C. He was wounded at Cambrai in 1918 and, being invalided out of the army, returned to Penang via America and Japan. In 1923 he joined R. B. Stewart in practice at Bourton-on-the-Water. He has been a liberal contributor both in service and subscription to social welfare organisations and particularly to the local branch of the British Legion, of which he was president at the time of his death. His garden along the bank of the Windrush was one of the sights of Bourton.

Dr. Liston was married first to Bella Mary Farlow, who died in Penang. By her he had four sons, one of whom died in infancy and another was killed on the Somme in 1917. His second marriage was to Evelyn Mary Mahler who, with his two sons, survives him.

SANDYS HOLDEN

T.D., M.B. LPOOL, D.P.H.

Dr. S. J. C. Holden, who died at his home in Aylesbury, Bucks, on Jan. 4 at the age of 55, had been twenty years county medical officer. He was working until two days before his death when he had a seizure. Born at Farnworth, Lancs, son of the Rev. Joseph Holden, he was educated at St. John's School, Leatherhead, and Liverpool University, where he qualified in medicine in 1907. After holding appointments at the Royal Infirmary and the South Dispensary he became tuberculosis officer and deputy M.O.H. at St. Helens, where he remained for nine years. During the war period he was sanitary officer at St. Omer, finally reaching the rank of lieut.-colonel, R.A.M.C.(T.). His war services left him with serious disabilities of which he made light but which contributed to his untimely death. In 1919 he succeeded A. H. Hogarth as chief medical officer for Bucks. Hogarth was not an easy man to follow, but under Holden the happy relations in the county health office were maintained. His patience and grasp of administrative detail smoothed the way of advance in all sections of public health work, and to the school, infant welfare, tuberculosis, and nursing services were added quietly effective departments of venereal diseases and veterinary medicine. It was never too far or too late in the day for Holden to go to any part of the county to discuss questions with a local nursing or welfare committee. He was easily approached by colleagues and staff, with whose work he never interfered. His relations with general practitioners in the county were made easy by the fact that with his sound knowledge of clinical medicine and his interest in diagnosis and treatment he might himself have been a practitioner. Unofficially he took a keen interest in the social welfare of the staff and was in request as a judge of ambulance competitions, and athletic and boxing meetings; no children's party in the neighbourhood was considered complete without him. He leaves a widow and a daughter.

GEORGE BARGER

D.SC., F.R.S.

Dr. George Barger, regius professor of chemistry at Glasgow, died suddenly on Jan. 6 in Switzerland, at the age of 60. Sir Henry Dale writes:

"George Barger always regarded himself as a chemist, and, of the many recognitions which he received, he was especially proud of and gratified by those which laid emphasis on the importance of his work for chemistry as such; the Davy medal of the Royal Society, awarded less than two months ago, being the most recent of these. He was, indeed, in the front rank of the British chemists of his time. From quite an early stage, however, his own training and instinct, as well as the appointments which he accepted, led him to deal with chemical problems which had significance for biology and medicine. Although chemistry was his first subject at Cambridge, he had been placed in the first class in botany also, his subsidiary study, in part II of the tripos; and he had demonstrated botany for a period in Brussels before he went as chemist to the Wellcome Physiological Research Laboratories, where my own association with him began. He had, indeed, made some preliminary preparations from ergot before we came together. For the next five years we worked on this curious drug in perfect collaboration. The subject proved to hold unexpected riches of interest, for Barger in chemistry, as for myself in physiology. When Barger and F. H. Carr (then of the Wellcome Chemical Works) had isolated the alkaloid ergotoxine, it soon became evident that many extracts of ergot contained substances with other actions, and an exploratory detour into the nature and actions of amines produced by putrefaction led us to find these also, as we had guessed, in ergot extracts. Thus came tyramine and Barger's preparation of the sympatho-

mimetic amine series, between tyramine and adrenaline; and later came histamine. With the identification of the latter as responsible for a particular action of an ergot preparation, and its later isolation from an intestinal extract, Barger's chemistry had opened a chapter in physiology and pathology of which new pages are still being written; and, though he himself went shortly afterwards to an academic post in chemistry, it was his former pupil and collaborator, A. J. Ewins, who, by isolating acetylcholine from another ergot extract, made an important step towards another development in physiology, which is even more active at present.

"To my great joy Barger consented to join forces with me again under the Medical Research Committee (now Council) in 1914; but this renewed association was to be in the abnormal war years, when we found ourselves engaged on urgent and largely separate problems, to serve immediate national needs. When he went to Edinburgh, in 1919, he seemed to have a more direct opportunity of giving a medical trend and application to his activities, in organising instruction and research on the chemical side, throughout the range of medical studies. Circumstances prevented this full development, but Barger's work and that of his pupils, to which he gave so much, continued to influence medical progress at numerous points. C. R. Harington had not long left Barger's laboratory when he embarked on the brilliant studies which revealed the structure of thyroxine, and Barger collaborated with his former pupil in the final synthesis of this hormone. It was as Barger's pupil and collaborator, again, that Edgar Stedman began the studies on physostigmine, which led, on the one hand, to the production of an important series of substances of analogous action, and so elsewhere to 'prostigmine,' and, on the other hand, to the identification of the esterase inhibited by these alkaloids as a specific cholinesterase, with results of great importance to the chapter of physiology concerned with acetylcholine. It was with Barger, yet again, that A. R. Todd and his co-workers began more recently their investigations contributing to the elucidation of the structure of vitamin B_1 (aneurine), and culminating in one of the processes by which that substance can now be made by artificial synthesis. Barger, meanwhile, had made other important contributions, hitherto chiefly of chemical interest, to the structure of several alkaloids. In 1937 he migrated to Glasgow, as Regius Professor of Chemistry, and we shall never know what he might have made of this new and wider opportunity.

"A mere record of Barger's research activities, however, gives no indication of the close personal relations which he had established with men all over the world working in the medical sciences, and particularly in physiology and biochemistry. By parentage, education, and temperament he had special qualifications for international contacts, for, though he was born in Manchester, his father was Dutch and his mother English, his schooling in Holland had made him already multilingual, and throughout his life he added new languages to a remarkable repertoire whenever a holiday or a scientific congress made opportunity. Physiologists in particular came to regard him, half humorously, as their polyglot orator. At their Moscow congress in 1935 he was chosen to return thanks for all the visitors, and did it in eight languages, including Russian, which he had acquired for the occasion. Apart from such formal opportunities, he travelled often and widely, making and renewing friendships wherever he went. Such a man could not but be more international than most, in his sentiments and his reactions; but nobody who really knew Barger could ever doubt the depth of his first loyalty to the Britain of his birth and his manhood, or mistake the warmth of an affection because it was neither blind nor exclusive. When the war ended he was eager and active for reconciliation. He was unsparing of time and enthusiasm to make the Congress of Physiologists, which met in Edinburgh in 1923, the first really international scientific congress held in this country after the war. The loss, tragically early and sudden, of his great personality will be sadly felt today in many countries, not only among chemists but also and especially by physiologists and biochemists, to whom his character and his influence have meant so much, in promoting understanding and good fellowship. From a multitude of friends and admirers, in many other countries as well as in his own, sympathy will flow to his widow, his two sons, and his daughter, bound to him by the strongest ties of affection and confidence."

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 31, 1938

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1572; diphtheria, 1096; enteric fever, 34 (23 "expected"); pneumonia (primary or influenzal), 1131; puerperal pyrexia, 141; cerebro-spinal fever, 24; acute poliomyelitis, 16; acute polio-encephalitis, 1; encephalitis lethargica, 5; dysentery, 13; ophthalmia neonatorum, 76. No case of cholera, plague, or typhus fever was notified during the week.

The combined notifications of acute poliomyelitis and acute polio-encephalitis total as follows for the current week and the previous 23 weeks (working backwards): 17, 31, 32, 30, 37, 42, 47, 53, 73, 74, 88, 85, 68, 56, 63, 83, 76, 82, 76, 83, 87, 63, 41, 29.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 6 was 3220, which included: Scarlet fever, 645; diphtheria, 1101 (carriers, 42); measles, 11; whooping-cough, 608; puerperal fever, 11 mothers (plus 4 babies); encephalitis lethargica, 297; poliomyelitis, 8. At St. Margaret's Hospital there were 24 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from enteric fever, 3 (0) from measles, 6 (0) from scarlet fever, 7 (1) from whooping-cough, 35 (6) from diphtheria, 51 (16) from diarrhœa and enteritis under two years, and 89 (8) from influenza. The figures in parentheses are those for London itself.

Liverpool reported the only death from typhoid. Fatal cases of diphtheria were scattered over 24 great towns, 3 each from Liverpool and Birmingham. Influenza was credited with 13 deaths at Liverpool, 6 at Hull, 3 each at Birkenhead and Bradford, not more than 2 at any other large town.

The number of stillbirths notified during the week was 219 (corresponding to a rate of 41 per 1000 total births), including 24 in London.

THE LANCET 100 YEARS AGO

January 12, 1839, *p.* 574.

FROM A LECTURE BY M. MAGENDIE

. . . For my own part, I care little for the learned prescriptions in which the majority of practitioners delight; the mysterious dignity of their composition always seems to me calculated to throw chaff in the eyes of the vulgar, and rather to enhance the merit of the physician than really to effect the recovery of the patient. Though my amour-propre may often suffer thereby, I prefer infinitely to abstain from prescribing altogether, to ordering drugs respecting the effects of which I am ignorant.

LETTERS TO THE EDITOR

MULTIPLE ANÆSTHESIA

SIR,—I have read with great interest the article on Pentothal with Nitrous Oxide and Oxygen by Drs. Organe and Broad (*Lancet*, 1938, **2**, 1170) and the subsequent correspondence. It appears to me, however, that your correspondents have overlooked the real objection to the methods advocated by the authors of that article. This does not depend on the multiplicity of drugs involved; we all give "anæsthetic cocktails," and if given judiciously these may be of great benefit to our patients. It is the ingredients of such a cocktail, and the indications for its use, that are of greatest importance.

It appears that the originators of this new technique would have us substitute for a relatively harmless drug (ether) one which is known to be much more toxic to all the bodily functions (pentothal); and they wish to substitute for the easy technique of inhalational anæsthesia a highly complicated technique, much less easily controllable, involving much greater possibilities of harming the patient, and taking up so much of the time and attention of the anæsthetist and theatre staff that it is difficult to believe that any surgeon could operate comfortably in such an atmosphere.

Even so, such methods might be justifiably advocated did they bring to our patients any great compensating advantages. But it is hard to see what is to be gained by the methods advocated here. Of the indications for this complicated technique given by Drs. Organe and Broad two seem very doubtful—namely, No. 3 "for herniotomies, tonsillectomies, and prolonged dental operations," and No. 4 "for perineal and anal surgery." For Group 2 ("patients with active or latent pulmonary diseases") cyclopropane would probably be preferable; while for Group 1 ("when the cautery is to be used") a closed technique with carbon-dioxide absorption might usually give equal if not greater safety.

Indeed it appears on reflection that the chief justification for such methods lies in the fact that they are spectacular. While not denying their possible value in a small minority of cases, I doubt whether they advance in any way the science of anæsthesia. In my opinion this art and science will only be advanced by the development of a simpler technique employing less toxic drugs.

I am, Sir, yours faithfully,

Harley Street, W.1, Jan. 6. R. BLAIR GOULD.

HYPERTENSION

SIR,—On Dec. 24 you drew attention to the work of Verney and Vogt on the relation of salt intake to hypertension. May I point out that the same paper deals with protein intake in relation to high blood-pressure. This work supports and confirms the conclusions arrived at in my book "High Blood Pressure"; and a scientific method—the only one I know—for treatment of high blood-pressure is given in this volume. Since the publication of "High Blood Pressure" a considerable number of cases have been under treatment by this method, and the clinical evidence, too, supports the general conclusion arrived at. Nocturia has either disappeared entirely or become less frequent, and such complaints as headaches have been allayed and the general condition of the patient improved under this régime.

The work of Verney and Vogt deals with renal hypertension. We may however take it as a fact that in every case of so-called essential high blood-pressure the kidney is affected. I very much doubt whether it is desirable at all to differentiate between the one and the other type of hypertension.

The earlier the patients are put under this treatment the better the result. And as, according to the estimation of Prof. J. B. Duguid (personal communication), about 40 per cent. of normal late-middle-aged people show some damage to the kidney, it is desirable that the protein intake should be limited generally in people who have reached middle age. I therefore suggested in my book "Diet and High Blood Pressure" that generally the protein intake should be sufficient to cover the requirements of wear and tear of the tissues only, and that for purposes of energy carbohydrate and fat should be used. At present, under the conditions in which middle-class people are living, the kidney has to do about eight to ten times more work than is absolutely necessary.

We are studying abnormal wear and tear at the Institute of Research for the Prevention of Disease, which offers the only possible method of dealing with a good many conditions based on degenerative changes of different organs.

I am, Sir, yours faithfully,

Liverpool, 1, Jan. 2. I. HARRIS.

OXYCEPHALY

SIR,—The pathological note by Dr. R. S. Handley in the article on oxycephaly published in your issue of Nov. 26 interested me greatly. It is the first time I have met the histopathological examination of an oxycephalic skull, in something over 250 papers. The authors seem entitled to congratulations on their pioneer efforts.

I wonder whether Dr. Handley's findings throw any light on the nature of the pathological change in oxycephaly. As I understand the situation, there are two main hypotheses, and preliminary recollection of the function of a suture line will be helpful to their consideration.

The word "suture" suggests something which unites. In this connexion, it stands for the opposite: cranial sutures separate bone. It is true that the skull bones join in later life, but for years they remain distinct. When the bones fuse, the sutures are said to be obliterated. The two hypotheses respectively incriminate the processes of ossification and the limiting activity of suture lines.

The first and older view is that normal suture lines are transgressed by viciously overactive bone-forming tissues. The second more recent one was advanced by E. A. Park and G. F. Powers (*Amer. J. Dis. Child.* 1920, **20**, 235). They postulated an aplasia of the cranial bones, and a corresponding absence of the limiting activity of suture lines. Put in other words—sutures are never formed. In consequence "where the bones touch they fuse." Existing evidence supports this latter theory. I do not wish to elaborate this further. What I am concerned with is the bearing of Dr. Handley's findings on the problem.

He describes an absence of the periosteum from the medial edge of the parietal bones, and "considerable evidence of osteoblastic activity." This latter does not appear to have been in vicious or pathological excess. Had it been, the finding would have supported the older hypothesis. As it is, the unusual activity is possibly the result of a diminution in

blood-supply due to the raised intracranial pressure found in this disease, and undoubtedly present in this case. The common occurrence of unusually hard cranial bone in oxycephaly fits in with this explanation of the finding. The absence of periosteum on the medial edge of the parietal bone then, to my mind, is in favour of the newer hypothesis.

I am, Sir, yours faithfully,

Westminster Hospital, S.W.1, Jan. 8. D. FERRIMAN.

THE R.M.B.F.'s CHRISTMAS GIFTS

SIR,—I am deeply indebted to you for the help which you rendered in allowing my Christmas appeal to be placed before your readers. The response was so generous that the amount subscribed enabled us to give a Christmas gift of 30*s.* to every one of our regular beneficiaries.

Of the many letters of thanks received the majority refer not only to the great pleasure of an unexpected gift but also to the fact that, during the exceptionally cold spell of weather in December, it enabled more warmth to be obtained, either by extra coal or extra money for the gas meter. All desired that I should express their heartfelt thanks to the many "unknown friends" who had remembered them and had made the distribution of the gifts possible.

It is this message of gratitude and deep appreciation which I ask you to convey to your readers.

I am, Sir, yours faithfully,

THOS. BARLOW,
President, Royal Medical Benevolent Fund.

11, Chandos Street, Cavendish Square,
London, W.1, Jan. 5.

AFTERCARE?

SIR,—In a leading article last week you conclude your discussion on the aftercare of the tuberculous by stating that, if prevention were adequate, the problem of aftercare would not arise. I am amazed that in practice this has not been realised adequately in this country. With the knowledge that we at present possess tuberculosis could be reduced to an almost negligible problem within ten years. This can be achieved in part by seeking out and treating the source of infection in each new case of human tuberculosis that is notified. Each case is, without question, the result of massive infection from some close associate. This source usually resides in the elderly fibrocaseous chest, even yet unexamined in our search for contacts. As I write this many cases spring to mind, seen in general hospital practice in the past twelve years. I quote just three of these:—

(1) A man, aged 68, wheeled almost moribund into my ward with an acute spread from an old tuberculous cavity. The halting explanation of his condition that he gave was that he had "caught cold" when the tuberculosis authorities had turned him out of his bedroom in order to disinfect it, because his daughter had just been taken to a sanatorium, while his only son had died of the same condition five years previously. He himself had never been examined.

(2) A man of 55 came, at my request, to see me about his son aged 23, who was dying of generalised miliary tuberculosis. This son was the last survivor of a family of six children, all of whom together with their mother had died of tuberculosis. The father gave me this history in a voice denoting chronic laryngitis, interspersed with a cough which left no doubt as to where the source of infection lay. Despite the family having lived and died under several progressive local authorities this danger to the community had never been examined.

(3) A man, now aged 76, under my care with a large apical cavity and a sputum containing millions of tubercle bacilli. Twenty-eight years ago his only daughter died of "galloping consumption." From about that time this man, a semi-invalid, has coughed his way through innumerable common lodging-houses, causing untold infection.

"Contacts" may be important, but in my submission the elderly chronic purveyor of tuberculous infection has remained relatively untouched by our diagnostic net. Space does not permit my enlarging on "day" and "night" sanatoria on the Russian model, which we in this country could so easily copy and improve upon. Of course, this would need a higher valuation of human life than we have been accustomed to. I am, Sir, yours faithfully,

London, W.5, Jan. 10. H. JOULES.

GRAINS AND SCRUPLES

SIR,—Your Anatomist's finding that man's nearest relation on earth is the pig confirms that of the earlier anatomists in the University of Salerno. Debarred from dissecting the human body on religious grounds, they used the pig instead. The First Scholar at Salerno in Longfellow's "Golden Legend" mentions this fact in his account of the medical curriculum:—

> "After this there are five years more
> Wholly devoted to medicine,
> With lectures on chirurgical lore
> And dissections of the bodies of swine,
> As likest the human form divine."

I am, Sir, yours faithfully,

Jan. 7. ARTHUR S. MACNALTY.

WHITHER THE ALMONER?

SIR,—It is most welcome to find in your columns questions raised about the present developments of the almoner's work. The extended use of almoners in order to establish a direct contact between the consultant and the patient seems to be entirely inconsistent with the efforts which are being made to re-establish the position of the general practitioner. Moreover, it may be one of the factors, and not an unimportant one, in the increased number of out-patient attendances. The almoner tends to become far more than a link between the hospital and outside organisations, and in her zeal for carrying out social reform as well as undertaking social work tends to keep the patients under observation, in order that she may be acquainted with developments in their home circumstances.

Many of those who have had long years of work and association with the conditions of the community providing hospital patients, including eminent medical officers of health, realise that no one can ever actually obtain a grasp of the conditions merely from information supplied, and that the basis of social work must be in the homes of the people. The development of almoners' work is not only prejudicial to the position of the general practitioner but also can hardly be said to be in the best interest of the patients and the general amelioration of the conditions of the people.

I am, Sir, yours faithfully,

Jan. 9. HOUSE GOVERNOR.

"... In this field [natural knowledge] the standard of value is independent of race or nationality or any other measure than originality and scientific worth. Liberty of thought and action are essential for creative scientific work; and progress is impossible when restrictions are placed upon them. These principles of scientific freedom have been won through generations of struggle with Church and State, and when science neglects to assert them as fundamental conditions of creative work it will commit suicide."—Sir RICHARD GREGORY, F.R.S., *Nature, Lond.* Jan. 7, 1939, p. 2.

MEDICAL NEWS

University of London

At recent examinations the following candidates were successful :—

M.D.

Branch I (*Medicine*).—R. F. Clarke, St. Bart.'s ; J. G. Clothier, King's Coll. Hosp. ; J. H. Cobb, Univ. Coll. Hosp. ; P. C. C. de Silva, King's Coll. Hosp. ; G. G. Gillam, Univ. Coll. Hosp. ; F. J. D. Knights, Middlesex Hosp. ; K. A. Latter, St. Bart.'s ; Eric Samuel, Middlesex Hosp. ; and R. N. Tattersall, Leeds.

Branch II (*Pathology*).—R. G. Macfarlane (university medal), St. Bart.'s.

Branch III (*Psychological Medicine*).—Joyce McConnell, Roy. Free.

Branch IV (*Midwifery and Diseases of Women*).—J. E. Giesen, Guy's ; Nora L. Keevil, Roy. Free ; E. R. Rees, St. Bart.'s ; C. G. Roworth, Univ. Coll. Hosp. ; Mary G. Tate, Roy. Free ; and Eileen M. Whapham, Roy. Free.

Branch V (*Hygiene*).—Morris Markowe, Charing Cross and London School of Hygiene.

University College.—On Feb. 6 and 8, at 5 P.M., Prof. J. H. Burn will lecture at the college on the action of drugs in muscular fatigue and as circulatory restoratives. Mr. L. Young, Ph.D., will give the first of three lectures on animal detoxication mechanism on Feb. 27 at 5 P.M., and Prof. A. Frey-Wyssling of the Swiss Federal Institute of Technology, Zürich, will speak on the submicroscopic morphology of protoplasm and its derivatives on March 6, 7, and 9, at 5.15 P.M. On Feb. 8 at 7.30 P.M., Dr. Maitland Radford, medical officer of health for St. Pancras, will give a lecture on slum clearance. All the lectures are open to those interested.

Order of St. John of Jerusalem

The following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem have been sanctioned by the King :—

As Knight.—Leslie Winter Dryland, M.R.C.S.

As Commander.—Alfred Gelsthorpe Osborn, M.B. (since deceased), Colonel George Charles Edward Simpson, O.B.E., T.D., F.R.C.S., The Hon. William Henry Kauntze, C.M.G., M.B.E., M.D., Alfred Galen Scheele Broughton, M.B., Lieut.-Colonel William Blackwood, D.S.O., M.B., Captain Francis Harold Rodier Heath, M.R.C.S.

As Officer.—John Ambrose Carman, M.D., John Araluen Kennedy, M.B., Harry Mark Palmer, M.R.C.S., Donald Eadie Brown, M.B.E., M.B., Lieut.-Colonel William Ross Stewart, C.I.E., F.R.C.S., I.M.S., Colonel William Archibald, M.D., Frederick William Morton Palmer, M.D., Colonel Charles Henry Stennett Redmond, T.D., M.B., A.M.S., Lieut.-Colonel Frederick Walter Whitney Dawson, M.B., Robert Yelverton Stones, O.B.E., M.C., M.R.C.P., John Phimister Mitchell, O.B.E., M.D., Captain David Collingwood Low, M.D., Lieut.-Colonel George Chester Lawson, M.D., Miss Sybil Caridwen Bevan, M.B.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on Jan. 4, Mr. V. Warren Low presiding, a sum of £2216 was voted for the half-yearly grants to the 62 widows and 4 orphans in receipt of relief. The death was reported of a beneficiary, aged 63, who came on the funds in 1890 at the age of 15, at the same time as her mother and three sisters. In the following year, being a cripple, she was eligible for help from a special fund and received altogether £2320 in grants. At the recent Christmastide a present of £5 was made to each widow and orphan. Two fresh applications for relief were received from widows of members, £60 per annum being voted in each case. Membership is open to any registered medical man residing at the time of election within a twenty-mile radius of Charing Cross. Particulars from the secretary at 11, Chandos Street, London, W.1.

Royal Sanitary Institute

The Earl of Harewood has accepted the office of president of the health congress of this institute which is to be held at Scarborough from July 3 to 8. The work of the congress will be divided into sections dealing with preventive medicine ; engineering, architecture, and town planning ; maternity, child welfare, and school hygiene ; veterinary hygiene ; national health insurance ; hygiene in industry ; and tropical hygiene. There will also be conferences of representatives of local authorities, medical officers of health, engineers and surveyors, sanitary inspectors, and health visitors. Further information may be had from the secretary of the institute, 90, Buckingham Palace Road, London, S.W.1.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on Jan. 9, Dr. Mohamed Emara (Cairo) was admitted to the fellowship.

Hunterian Society

The Hunterian lecture of this society which Prof. Emil de Grosz (Budapest) was to have delivered on Jan. 16 has had to be postponed; Prof. de Grosz will give it instead on April 17 at 9 P.M., at the Mansion House, London, E.C.4, when he will speak on the problem of glaucoma. The annual general meeting of the society will be held on May 8.

Department of Scientific and Industrial Research

Prof. E. V. Appleton, F.R.S., has been appointed secretary to this department in succession to Sir Frank Smith, F.R.S., who is resigning. Prof. Appleton is Jacksonian professor of natural philosophy in the University of Cambridge.

Prize in Ophthalmology

The next award of the Gifford Edmonds prize will be made for the best essay on the ocular manifestation of Graves's disease submitted before Dec. 31, 1940. Further particulars may be had from the secretary of the Royal London Ophthalmic Hospital (Moorfields), City Road, E.C.1.

New Welfare Centre in Hackney

The Elsdale-street maternity and child welfare centre, the second centre to be erected by the borough council, was opened by the mayoress of Hackney on Jan. 7. The building, which with furniture and equipment has cost £11,000, is on two floors. On the ground floor there is accommodation for the antenatal and child-welfare clinics, with a dispensary and a hall for lectures and demonstrations. The first floor provides for the light and massage departments. The centre will replace one formerly carried on in Lauriston Road.

Medical Experiences in Spain

The medical members of the Spanish Medical Aid Committee are inviting their professional colleagues to meet eight British doctors who have been serving in Spain and have returned since the evacuation of foreign personnel by the Republican government. The meeting will be held at B.M.A. House, Tavistock Square, London, W.C.1, on Wednesday next, Jan. 18 ; there will be a conversazione with light refreshments from 8.30 to 9.15 P.M., after which the returned doctors will make a report on their work, and questions and discussion will be invited. Admission will be by ticket, to be obtained either in advance from Dr. H. C. Boyde, 85, Freemasons Road, E.16 (Tel. : Albert Dock 1677), or on application to the ticket-clerk at the hall on the night. It is hoped that those who intend to be present will if possible let Dr. Boyde know in advance.

Niepce and Daguerre

The centenary of the invention of photography, just celebrated in Paris under the patronage of the president of the Republic, has helped to clear up once and for all the identity of the inventors. Nicéphore Niepce, a chemist born at Chalon-sur-Saone (1765–1833), was the inventor of photography in its rudiments; his cousin, Claude Niepce deSaint-Victor Niepce, born at St. Cyr (1805–1870), was the inventor of photography on glass. Louis Jacques Mandé Daguerre, an artist born at Cormeilles (Seine-et-Oise), conceived the invention of the diorama, in which views subjected to a play of lighting while the spectator sits in darkness produce the illusion of reality. Daguerre perfected photography as invented by Niepce. He lived from 1789 to 1851 and produced in 1839 excellent photographs on a plate of copper sensitised by the vapour of iodine or bromine and developed by mercury vapour. The examples of his work have proved lasting when not exposed to direct sunlight..

Prof. P. O. Rosin is giving a further lecture with a cinema film on The Aerodynamics of the Domestic Open Fire at the Institution of Civil Engineers, Great George Street, Westminster, on Jan. 25 at 6 P.M. Tickets may be obtained from the British Coal Utilisation Research Association, 54, Victoria Street, S.W.1.

Medical Society of Individual Psychology

The annual dinner of this society will be held on Thursday, Jan. 19, at 7.45 P.M., at the Florence Restaurant, Rupert Street, London, W.1, when the principal guests will be Prof. John MacMurray and Mr. Ashley Dukes.

Chancellor and Postgraduate School

On Jan. 9 the Earl of Athlone, chancellor of London University, paid a visit to the British Postgraduate Medical School. He said that he regarded the school as his own baby, for he had been chairman of the committee that had recommended its foundation. When King George V opened the school he expressed the hope that it would draw teachers and students from all parts of the world. That wish had been amply fulfilled. In the 3½ years of the school's existence 2299 medical men had studied there, including 696 practitioners attending refresher courses. The school had already outgrown its accommodation and more lecture theatres and laboratories were needed.

Course on Mental Deficiency

Lectures and clinical instruction for medical practitioners on mental deficiency and allied conditions have been arranged by the extension and tutorial classes council of the University of London in coöperation with the Central Association for Mental Welfare. The course is intended for qualified medical practitioners who are concerned with the care of subnormal or abnormal persons. The first part will be held from March 20 to April 1, when Dr. A. F. Tredgold will lecture on mental deficiency, Miss Lucy Fildes, Ph.D., on the psychology of mental defectives, Dr. Henry Herd on the work of the school medical officer in relation to the mentally defective, and Dr. A. Carleton Williams on administrative procedure in the ascertainment and treatment of the mentally defective under the mental deficiency acts. The second part of the course, devoted to the problems connected with the retarded and difficult child, will be given in the autumn. Further information may be had from Miss Evelyn Fox, university extension department, University of London, The Senate House, W.C.1.

B.M.A. Scholarships and Grants in Aid of Research

The council of the British Medical Association is prepared to receive applications for research scholarships and grants for assistance of research in connexion with disease.

Scholarships.—An Ernest Hart memorial scholarship (£200 per annum), a Walter Dixon scholarship (£200 per annum), and three research scholarships (each £150 per annum). These scholarships are given to candidates whom the science committee of the association recommends as qualified to undertake research in any subject (including state medicine) relating to the causation, prevention, or treatment of disease. Preference will be given, other things being equal, to members of the medical profession. Each scholarship is tenable for one year, commencing on Oct. 1, 1939. A scholar may be reappointed for not more than two additional terms. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment do not interfere with his or her work as a scholar.

Grants.—Grants for the assistance of research in the causation, treatment, or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose as subjects of investigation problems directly related to practical medicine.

Application for scholarships and grants must be made not later than May 6, on the prescribed form, a copy of which will be supplied on application to the secretary of the association, B.M.A. House, Tavistock Square, London, W.C.1. Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

Royal Microscopical Society

The annual meeting of this society will be held at B.M.A. House, Tavistock Square, London, W.C.1, on Wednesday, Jan. 18, at 5.30 P.M., when Mr. J. E. Barnard, F.R.S., will deliver his presidential address. He has chosen as its title Towards the Smallest Living Things.

Royal Society of Arts

On Tuesday, Feb. 7, at 4.30 P.M., Sir Malcolm Watson will speak to the dominions and colonies section of this society on the work of the Ross Institute of Tropical Hygiene. The meeting will be held at the house of the society, John Street, Adelphi, W.C.2.

British Empire Cancer Campaign

Viscount Hailsham presided at the 69th quarterly meeting of the grand council of this campaign, held in London on Monday last. It was announced that the new propaganda film prepared by Gaumont-British will soon be ready for release. Grants totalling £22,526 were made towards cancer research during 1939, bringing the total amount approved to date for the year up to £38,000. A further grant of £1350 was made to meet additional expenses to be incurred by the clinical cancer research committee.

The Ministry of Health's Exhibition

On Monday last Mr. Robert Bernays, parliamentary secretary to the Ministry of Health, opened at Messrs. Selfridge's, Oxford Street, London, W.1, the Ministry's exhibition "Towards a Fitter Britain." Over 4 million people, he said, had seen this exhibition at Glasgow, and later it was to be handed over to the Central Council for Health Education. Among the various items the housing exhibit showed the transformation of the slum to the new housing estate. He recommended also the food charts which gave simply and graphically essential information about nutrition and the right approach to a balanced diet, and the exhibits devoted to the health of mothers and children. He hoped that as many people as possible, both in London and the provinces, would visit the exhibition.

PUBLIC HEALTH

THE EVACUATION AREAS

A SCHEDULE issued by the Ministry of Health on Jan. 9 divides the country for purposes of evacuation into three groups. (1) A limited number of large crowded areas from which evacuation is to take place. (2) A number of "neutral" areas, mainly situated around the large towns, which are not to be evacuated but are also not to be used for reception. (3) The areas considered most suitable for reception.

The following counties contain no neutral or evacuation areas. In England: Bedford, Berks, Buckingham, Cambridge, Cumberland, Dorset, Isle of Ely, Hereford, Huntingdon, Lincoln (parts of Holland and parts of Kesteven), Northampton, Oxford, Soke of Peterborough, Rutland, Salop, East and West Suffolk, East and West Sussex, Westmorland, Isle of Wight, and Wilts. In Wales: Anglesey, Brecknock, Caernarvon, Cardigan, Carmarthen, Denbigh, Flint, Merioneth, Montgomery, Pembroke, and Radnor.

The evacuation areas comprise all the metropolitan boroughs, and the neighbouring boroughs of East and West Ham, Barking, Ilford, Leyton, Walthamstow, Edmonton, Hornsey, Tottenham, Willesden, and Acton. The list also includes Southampton, Portsmouth, and Gosport; Chatham, Gillingham, and Rochester; Birmingham and Smethwick; Liverpool, Birkenhead, Bootle, and part of Wallasey; Manchester and Salford with parts of Crosby and Stretford; Sheffield; Leeds and Bradford; Kingston-upon-Hull; Newcastle-on-Tyne and Gateshead.

Medical Diary

Jan. 16 to Jan. 21

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

TUESDAY.—5.30 P.M., general meeting of fellows.

Orthopædics. 5.30 P.M. (cases at 4.30 P.M.), Mr. K. I. Nissen: (1) Osteoclastoma of the Ischium and Pubis treated by Teleradium. Mr. G. O. Tippett: (2) Bilateral Injury of Biceps. (3) Skiagrams of End-Result of Fractured Neck of Femur. (4) Skiagrams of Spine Showing Hernia of Disc following Manipulation. Mr. B. H. Burns: (5) Scalenus Anticus Syndrome.

Pathology. 8.30 P.M., laboratory meeting at the Lister Institute, Chelsea Bridge Road, S.W.1.

THURSDAY.

Dermatology. 5 P.M. (cases at 4 P.M.), Dr. Albert Eidinow: Radio-active Ointment as a Method of Surface Radium Therapy.

Neurology. 8.30 P.M., Dr. W. Ritchie Russell, Dr. H. L. Sheehan, Dr. Redvers Ironside, and Dr. H. G. Garland: The Neurological Complications of Pregnancy.

FRIDAY.

Physical Medicine. 4.30 P.M., Prof. Samson Wright: The Physiological Aspects of Rheumatism.

Obstetrics and Gynæcology. 8 P.M., Prof. G. I. Strachan: Precarcinomatous Conditions of the Cervix. Mr. V. B. Green-Armytage: Lower Segment Cæsarean Section (illustrated by colour film). Mr. J. A. Stallworthy: Mixed-cell Sarcoma of the Uterus. Mr. Norman White: Three Skiagrams of Breech Presentation.

Radiology. 8.30 P.M., Dr. J. Struthers Fulton: Radiation Therapy in Tumours of Bone.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland Place, W.1.

THURSDAY.—8.15 P.M., Mr. Kenneth Smith, D.Sc., F.R.S.: The Study of Plant Viruses with special reference to their Insect-Relationships and some comparisons with the Animal Viruses. Prof. S. P. Bedson, F.R.S., will also speak.

CHELSEA CLINICAL SOCIETY.

TUESDAY.—8.30 P.M. (Rembrandt Hotel, Thurloe Place, S.W.7), Dr. W. H. de B. Hubert: Drug Addiction.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.

WEDNESDAY.—9 P.M. (Royal Northern Hospital, Holloway Road, N.7), Mr. W. B. Gabriel: The Diagnosis and Treatment of Some Common Rectal Diseases.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1.

THURSDAY.—8 P.M., Dr. J. F. Brailsford: Simple Radiographic Methods for the Localisation of Foreign Bodies.

Medical Committee.

FRIDAY.—11 A.M., visit to the Royal Cancer Hospital (Free), Fulham Road, S.W.3. 5.30 P.M., case demonstration and discussion at the institute.

EUGENICS SOCIETY.

TUESDAY.—5.15 P.M. (rooms of the Royal Society, Burlington House, Piccadilly, W.1), Dr. Felix Tietze: Eugenic Measures in the Third Reich.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2.

MONDAY.—5 P.M., Mr. Cecil Joll: Pathology, Diagnosis, and Treatment of Hashimoto's Disease (Struma Lymphomatosa).

WEDNESDAY.—Prof. J. Paterson Ross: The Effects of Radium on Carcinoma of the Breast.

FRIDAY.—Mr. A. J. Gardham: Classification of New Growths of the Mouth in Relation to Treatment and Prognosis (Hunterian lectures).

TAVISTOCK CLINIC, Malet Place, W.C.1.

MONDAY.—4.30 P.M., Dr. H. V. Dicks: Anxiety States.

THURSDAY.—2.30 P.M., Dr. H. Crichton-Miller: Conversion Hysteria. 3.30 P.M., Dr. Crichton-Miller: Anxiety States. Dr. T. W. Mitchell: The Mind in Infancy.

INSTITUTE OF PSYCHO-ANALYSIS, 96, Gloucester Place, W.1.

TUESDAY.—8.30 P.M., Dr. W. H. Gillespie: Somatic Neurosis.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

MONDAY and TUESDAY.—4.30 P.M., Dr. Izod Bennett: Nephritis.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Mr. E. J. King, Ph.D.: Liver Function. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. J. Shaw Dunn: Nephritis, and Renal Changes in Hypertension.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Prof. J. Munro Kerr: Disproportion and Difficult Labour.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. R. Watson Jones: Fracture Dislocations and other Injuries of the Joints.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. GEORGE'S HOSPITAL, S.W.1.

THURSDAY.—5 P.M., Dr. Anthony Feiling: Neurological demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C.1.

THURSDAY.—2 P.M., Dr. Reginald Lightwood: Modifications of Cow's Milk in Infant-Feeding. 3 P.M., Dr. D. N. Nabarro: Human and Bovine Tuberculous Infection in Children. Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn Road, W.C.1.

FRIDAY.—4 P.M., Mr. W. A. Mill: Difficulty in Swallowing.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh Road, S.W.1.

FRIDAY.—3.30 P.M., Dr. Francis Bach: The Rheumatic Diseases of the Spine.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2.

TUESDAY.—5 P.M., Dr. W. Griffith: Eczema.

WEDNESDAY.—5 P.M., Dr. I. Muende: Introduction to Histopathology of the Skin (Chesterfield lectures).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

MONDAY to SATURDAY.—WEST END HOSPITAL FOR NERVOUS DISEASES, in-patient department, Gloucester Gate, N.W.1. Mon. and Fri., 8 P.M., lecture-demonstration in neurosurgery.—ST. JOHN'S HOSPITAL, 5, Lisle Street, W.C.2, afternoon course in dermatology. (Open to non-members.)—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland Street, W.1, all-day course in cardiology. (Open to non-members.)—ST. PETER'S HOSPITAL, Henrietta Street, W.C.2, all-day course in urology. (Open to men only.)

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY.—4.15 P.M. (Ear, Nose, and Throat Hospital), Dr. Charles Macartney: clinical cases.

Births, Marriages, and Deaths

BIRTHS

BEET.—On Jan. 4, at Lusaka, N. Rhodesia, the wife of Dr. E. A. Beet, Colonial Medical Service—a son.

BROWNING.—On Jan. 5, to Dr. and Mrs. S. Barratt Browning, Wellington House, Handsworth Wood, Birmingham—a daughter.

CAROTHERS.—On Jan. 3, at Nairobi, the wife of Dr. Colin Carothers, Kenya Medical Service—a daughter.

GROVES.—On Jan. 6, at Devonshire Place, W.1, the wife of Dr. John Nixon Groves—a daughter.

RUSHTON.—On Jan. 6, the wife of Dr. Peter Rushton, of Leigh-on-Sea—a son.

SHIRLEY SMITH.—On Jan. 4, at Bentinck Street, W.1, the wife of Dr. K. Shirley Smith—a daughter.

THOMAS.—On Jan. 5, at Welbeck Street, W.1, the wife of Dr. A. Robinson Thomas—a daughter.

MARRIAGES

MARSHALL—PLATT.—On Jan. 5, at St. James's Church, Piccadilly, James Marshall, M.B., to Eileen Mary Platt.

PLEWES—DOWNING.—On Dec. 31, at Dorchester Abbey, Oxford, Lawrence William Plewes, F.R.C.S.E., to Faith Sybil Etrenne Downing.

DEATHS

BEADEL.—On Jan. 6, at Rustington, Algernon James Beadel, M.R.C.S., aged 61.

COCKS.—On Jan. 2, at Petersfield, Lt.-Col. Horace Cocks, M.B. Edin., R.A.M.C. (retd.), late of St. Cross, Winchester.

COLE.—On Jan. 7, Thomas Edwyn Cecil Cole, M.A., M.D. Oxfd, of Leamington Spa.

CROWLE.—On Jan. 7, Thomas Henry Rickard Crowle, F.R.C.S., of Upper Montagu Street, W.1, aged 76.

CUTHBERT.—On Jan. 9, at Felixstowe, Charles Firmin Cuthbert, F.R.C.S.E., late of Gloucester, aged 81.

FISHER.—On Jan. 8, at Skipton, Yorkshire, George Edward Fisher, L.R.C.S.I., aged 81.

HOLDEN.—On Jan. 4, at Aylesbury, Sandys Jackson Charlesworth Holden, M.B. Lpool, D.P.H., T.D., aged 55.

JUPE.—On Jan. 4, at Midhurst, Francis Isaiah Maggs Jupe, M.A. Camb., L.S.A.

MACDONALD.—On Jan. 4, in Jersey, Wing Comdr. John Norman Macdonald, M.R.C.S., late of Hove.

MACLEOD.—On Jan. 9, 1939, at 70B, Ladbroke Grove, W.11, Charles Edward Alexander MacLeod, F.R.C.S. Eng., aged 71.

MORISON.—Jan. 9, in Newcastle-upon-Tyne, James Rutherford, M.D., F.R.C.S., emeritus professor of surgery, the University of Durham. Aged 85 years.

WAGGETT.—On Jan. 5, at Cavendish Court, W.1, Ernest Blechynden Waggett, C.B.E., D.S.O., T.D., M.B. Camb., aged 72.

WELCH.—On Dec. 31, at Zanzibar, Harvey Henry Vincent Welch, F.R.C.S.E., of Henfield, Sussex, aged 51.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths

Appointments

BEDDARD, R. J. J., M.R.C.S., hon. anæsthetist to the Royal United Hospital, Bath.
BLUSGER, I. N., B.A. Cape Town, F.R.C.S., senior resident surgical officer at the Connaught Hospital, London.
CHERNIACK, LEWIS, M.D. Manitoba, M.R.C.P., resident medical registrar at the Royal Chest Hospital, London.
DRAKE, E. P. HALL, M.B. Camb., F.R.C.S., resident surgical officer at the Royal Infirmary, Sheffield.
FORREST, A. R., M.B. Aberd., D.P.H., medical officer of health and port medical officer for Barrow-in-Furness.
HAND, R. F., M.B. Glasg., D.T.M. & H., resident medical superintendent at the Hospital for Tropical Diseases, London.
MACCARTHY, DERMOD, M.B. Lond., out-patient medical registrar at the Hospital for Sick Children, Great Ormond Street.
MARTIN, H. M., M.Ch. Dubl., F.R.C.S.E., hon. surgical registrar to the Royal United Hospital, Bath.
PARKER, GILBERT, M.B. Aberd., F.R.C.S.E., assistant hon. surgeon to the North Riding Infirmary, Middlesbrough.
PRICE, R. E. A., M.B. Lond., hon. dermatologist to the Connaught Hospital, London.
SHARP, WILLIAM, M.B. Leeds, D.P.M., first assistant medical officer at Botleys Park Colony, Chertsey.
TELLING, MAXWELL, B.M. Oxfd, M.R.C.P., house physician at the London Chest Hospital.
WIESNER, B. P., D.Sc. Edin., Ph.D. Vienna, hon. biologist to the Royal Northern Hospital, London.
WILLIAMS, EDNA I., M.D. Lond., hon. anæsthetist to the Royal Infirmary, Chester.
WINTERTON, BRENDA, M.R.C.S., out-patient aural registrar at the Hospital for Sick Children, Great Ormond Street.
YATES, F. H., M.R.C.S., assistant pathologist at Ancoats Hospital, Manchester.

London Hospital.—The following appointments are announced:—
HUNTER, M. I. A., M.B. Camb., M.R.C.P., Paterson research scholar and chief assistant to the cardiac department;
OLIVER, L. C., F.R.C.S., first assistant to the department of neurosurgery; and
MAYER, G. S., M.B. Camb., F.R.C.S., surgical first assistant and registrar.

Colonial Service.—The following appointments are announced:—
LOWSON, J. M. A., M.B. St. And., M.R.C.P.E., D.T.M. & H., physician, Johore;
FAWDRY, A. L., M.B. Camb., district medical officer, Cyprus; and
IRVINE, D. F., M.B. Glasg., D.P.H., health officer, Malaya.

Vacancies

For further information refer to the advertisement columns

Altrincham, Cheshire, St. Anne's Home.—Res. surg. O., £200.
Army Dental Corps.—Commissions.
Banbury, Oxon., Horton General Hosp.—Res. M.O., at rate of £150.
Barbados General Hosp.—H.S. and anæsthetist, £450.
Barrow-in-Furness County Borough.—Asst. M.O.H. and asst. school M.O., £500.
*Battersea General Hosp., S.W.*11.—Res. H.S., at rate of £130.
*Belgrave Hosp. for Children, Clapham Road, S.W.*9.—Asst. physician.
Benenden, Kent, National Sanatorium.—H.P., at rate of £150.
Birmingham, Children's Hosp.—Receiving-room officer, £250.
Birmingham, Little Bromwich Hosp. for Infectious Diseases.—Jun. res. M.O., £300.
Birmingham University.—Third lecturer in bacteriology and asst. bacteriologist in public health laboratory, £350.
Bournemouth County Borough.—Asst. M.O.H., &c., £500.
Bradford, Royal Eye and Ear Hosp.—H.S., £180.
Brighton, Royal Sussex County Hosp.—Hon. physician.
Bristol General Hosp.—Two H.P.'s, Three H.S.'s, res. obstet. O., H.S. to spec. depts., and cas. H.S., each at rate of £80.
Bristol Royal Infirmary.—H.P.'s, H.S.'s, and obstet. H.S.'s, each at rate of £80, except sen. obstet. H.S., £100, and sen. cas. O., £150.
Burnley, Municipal General Hosp.—Jun. res. M.O., £150–£200.
Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.
*Connaught Hosp., E.*17.—Hon. physician.
Derbyshire Royal Infirmary.—H.S. for ear, throat, and nose dept., and H.S. for general surgery, each £150.
Dewsbury and District General Infirmary.—Sen. H.S. and second H.S., £200 and £150 respectively.
Dorking County Hosp.—Res. asst. M.O., at rate of £250.
*Dreadnought Hosp., Greenwich, S.E.*10.—Receiving-room officer, £150. Also H.P., at rate of £110.
Ealing Borough.—Asst. M.O., £450.
Edgware, Redhill County Hosp.—Cas. M.O., £350.
*Evelina Hosp. for Sick Children, Southwark, S.E.*1.—H.P., at rate of £120.
Exeter City and County.—Deputy M.O.H. and asst. tuber. officer, £550.
Glasgow Police Department.—Three cas. surgeons, each £600.
Grimsby and District Hosp.—Res. surg. O., at rate of £225. Also H.P. and jun. H.S. and cas. O., each at rate of £150.
Halifax County Borough.—Asst. M.O., &c., £500.
*Hampstead General Hosp., Haverstock Hill, N.W.*3.—H.P. and H.S., each at rate of £100. Also radiologist.
Harrogate Royal Bath Hosp.—Res. M.O., £200.
Hexham, Wooley Sanatorium.—Asst. M.O., £350.
*Hosp. for Sick Children, Great Ormond Street, W.C.*1.—Clin. pathologist, £600. Also out-patient surg. asst., £50.
*Hosp. for Tropical Diseases, Gordon Street, W.C.*1.—Two H.P.'s, each at rate of £120.
Huddersfield, Storthes Hill Mental Hosp., Kirkburton.—Asst. M.O., £350.
Huddersfield Royal Infirmary.—Cas. O., at rate of £200. Also H.S. and H.P., each at rate of £150.
Ilford, King George Hosp.—Cas. O. and surg. reg., £150.
Ilford Borough.—Asst. dental surgeon, £450.
*Invalid and Crippled Children's Hosp., Balaam Street, E.*13.—Res. M.O., £100.
Kent Education Committee.—Dental surgeon, £500.
Lancaster County Mental Hosp.—Asst. M.O., £550.
Lincoln, The Lawn.—Asst. M.O., £300.
Liverpool Heart Hosp.—H.P., at rate of £100.
Liverpool Royal Children's Hosp.—Hon. asst. physician.
*London Chest Hosp., Victoria Park, E.*2.—H.P., at rate of £100.
London County Council.—Asst. M.O. (class I), £350, asst. M.O. (class II), £250, temporary part-time rheumatism registrar, £350. Also temporary part-time asst. M.O.'s for school medical work, 30*s.* each per session.
*London Homœopathic Hosp., Great Ormond Street, W.C.*1.—H.S., H.P. also med. and cas. O., each at rate of £100.
Maidstone, West Kent General Hosp.—H.P., £175.
Manchester Northern Hosp., Cheetham Hill Road.—Res. H.P. and res. H.S., each at rate of £100.
Manchester Royal Children's Hosp., Pendlebury.—Res. surg. O., at rate of £150.
Manchester Royal Eye Hosp.—Jun. H.S., £120.
Middlesbrough Education Committee.—Asst. school M.O., £500.
*Middlesex Hosp., London, W.*1.—Research fellowship in physiotherapy, £250.
Newcastle General Hosp.—H.P.'s and H.S.'s, each at rate of £150.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Jun. surg. reg., £150.
Newcastle-upon-Tyne Hosp. for Children.—Two H.S.'s, each at rate of £100.
New Zealand, Otago University Medical School.—Professor of medicine, £2000. Also lecturer in biochemistry, £650.
Northamptonshire County Council.—Asst. county M.O. and district M.O.H., £800.
*Paddington Green Children's Hosp., W.*2.—Hon. physician to skin dept.
Plymouth, Prince of Wales's Hosp., Greenbank Road.—H.P. and H.S., each at rate of £120.
Preston, Biddulph Grange Orthopædic Hosp.—Jun. H.S., at rate of £200.
Preston, Sharoe Green Hosp.—Jun. asst. res. M.O., at rate of £100.
*Princess Elizabeth of York Hosp. for Children, Shadwell, E.*1.—H.P., at rate of £125.
*Queen Mary's Hosp. for the East End, Stratford, E.*15.—Hon. asst. aural surgeon.
*Queen's Hosp. for Children, Hackney Road, E.*2.—H.S., and Cas. O., each at rate of £100.
Rhondda Urban District Council.—Asst. M.O., £500.
Richmond, Surrey, Borough.—Asst. M.O.H., £500.
Rochdale Infirmary and Dispensary.—Sen. H.S., £250.
*Royal College of Physicians, Pall Mall East, S.W.*1.—Leverhulme research scholarship, £500. Also Streatfeild research scholarship in medicine and surgery, £250.
Royal Naval Medical Service.—M.O.'s.
*St. George's Hosp., S.W.*1.—Associate neurological surgeon.
*St. Pancras Borough Council Public Health Dept., Euston Road, N.W.*1.—M.O. for Gynæcological Clinic, 2 guineas per consultation.
*St. Thomas's Hosp., S.E.*1.—Surgeon to ear, nose, and throat dept.
*South London Hosp. for Women, Clapham Common, S.W.*4.—Surg. asst. to ear, nose, and throat dept., £25.
Southend-on-Sea General Hosp.—Surg. reg., £275.
Stepney Metropolitan Borough.—Deputy and Asst. M.O.H., £750.
Stirling District Mental Hosp., Larbert.—Third asst. M.O., £300. Also fourth asst. M.O., £250.
Stockport Infirmary.—Res. surg. O., £250.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Hon. asst. orthopædic surgeon. Also cas. H.S., at rate of £150.
Stoke-on-Trent City.—Sen. school M.O. and sen. assist. M.O.H., £750.
*University College Hosp., Gower Street, W.C.*1.—Registrar to Royal Ear Hospital, £250.
University of London.—Readership in biochemistry at Guy's Hosp. med. sch., £500.
*Victoria Hosp. for Children, Tite Street, Chelsea, S.W.*3.—H.P. and H.S., each at rate of £100.
West Bromwich, Hallam Hosp.—Asst. M.O., at rate of £200.
West Riding, Keighley and District Victoria Hosp.—Second res. M.O., at rate of £120.
Winchester, Royal Hampshire County Hosp.—H.S., at rate of £100.
Wolverhampton, Royal Hosp.—Asst. res. M.O. for gynæcological and obstet. dept., at rate of £100.
*Woolwich and District War Memorial Hosp., Shooters Hill, S.E.*18. Hon. anæsthetist.

INTERFERENCE DISSOCIATION: CORRIGENDUM.—In the article by Dr. Curtis Bain appearing on p. 20 of our last issue the penultimate sentence of the second paragraph should read: "If the P wave arrives much before the end of T, the ventricle will be refractory; if the P wave follows T, the ventricle may have already responded to the next nodal beat, or the prematurity will be so slight as to be doubtful."

NOTES, COMMENTS, AND ABSTRACTS

SELF-CONSCIOUSNESS AND PUBLIC SPEAKING

By E. N. Snowden, M.B. Lond.

PSYCHOLOGIST TO THE HOSPITAL FOR NERVOUS DISEASES, MAIDA VALE, LONDON; LATE CHIEF ASSISTANT, DEPARTMENT OF PSYCHOLOGICAL MEDICINE, ST. BARTHOLOMEW'S HOSPITAL

Everyone, at some time or another, has suffered under the affliction of having to listen to a speaker who is either inaudible or hesitant or has both these faults combined, and when, as often happens, the speaker is an expert on his subject, with something to say that is a valuable contribution to the knowledge of his audience, it can be a most irritating experience. It is even more annoying to be faced with these faults when the speaker is attempting to make an impromptu speech on what should be a friendly and informal occasion. Probably, before the speech begins, the speaker has been able to converse on his own or any other subject with fluency and ease, but when he faces his audience his whole manner changes and he becomes embarrassed and diffident.

So common are such experiences among well-educated people that it seems to be worth while to examine the causes which produce these phenomena and to try to find some simple means of avoiding them.

There are two chief causes which combine to produce this inability to speak in public, and, although they appear to belong to two entirely different spheres of life, in the circumstances of public speaking they are closely interrelated. They are *self-consciousness* and *lack of training* in the use of the voice for anything but ordinary conversation.

SELF-CONSCIOUSNESS

Self-consciousness means an awareness of a change in his physical and mental state by the person suffering from it. The physical change is the more important and, although usually considered to be psychological, is, in fact, physiological. It is, in nearly every case of the public speaker, a fear reaction. The speaker might deny the truth of this because his conscious reasoning assures him that he is not in any danger, but this reasoning does not in the least prevent his state of embarrassment, which goes to show that the mind has very little to do with the condition. It is an instinctive process, more subtle, and far deeper than any reasoning process, being a survival from the early origins of man when to be isolated was to be in danger. Once upon his feet, while all his fellows are sitting, the speaker is isolated and the centre of attention. From the primitive point of view he is in danger, and the fear reaction immediately begins to work.

The *fear reaction* is a complicated series of changes in the body. It is not a human characteristic only but in some form is present in nearly all living creatures. It is an essential factor in survival, and those species in which for some environmental reason the reaction has never been developed are rapidly exterminated if their environment is changed. The purpose of the reaction is to assist the animal to escape by increasing the activity of every part of the body that can help in this process and by decreasing the activity of those parts not required for the purpose. Since man is a running and climbing animal, the process is directed in him to an increase in the ability to run fast and far, and because of the complicated physiology of the human body the changes are very many and varied.

In the fullest activity, such as in states of extreme terror or panic, this reaction occupies the whole mind and body to the exclusion of every other consideration whatever, and in its less acute forms, such as in shyness, diffidence, or embarrassment, the changes are sufficient to attract the attention of the mind to such an extent as to prevent clear thinking in any other direction and to form the basis of physical self-consciousness.

This physical reaction cannot be prevented; it is present in some degree in every public speaker, however experienced. The effect of experience is to cause the reaction to be ignored until the feeling of uneasiness is lost in the speaker's interest in his subject. In the case of inexperience it prevents fluent thought by occupying the whole of consciousness and prevents fluent speech by its interference with the diaphragm and the vocal cords and by producing dryness of the mouth.

Mental self-consciousness is the result of experience and training and is as much a process of the mind as the series of changes above outlined are a process of the body. It is part of that series of mental activities which submits to a kind of censorship the ideas presented to the conscious mind, before these are expressed in words, and the education of this censorship is an essential part of the preparation through which all must pass before they can live comfortably with their fellows. It is as important an element in modern civilised life as the fear reaction in primitive existence.

TRAINING AND EXPERIENCE

In early childhood, as soon as fluent speech is achieved, every idea that presents itself to the mind is expressed in words, and because the child is eager to learn, it is usually expressed in the form of a question. These questions from their frankness are often embarrassing to their elders and offend against polite usage. The child is corrected or chidden and after a series of humiliating experiences learns to avoid expressing in words the forbidden subjects. In this way the child learns to examine each idea before it is put into words, and eventually this process becomes habitual and automatic and, because like all mental activities the process is very rapid, does not interfere with ordinary conversation. It is also carefully adjusted to suit the society in which the individual finds himself, so that an idea that can be freely expressed to one person must be avoided in speaking to another, and it has this effect, from the point of view of the public speaker, that with a mixed audience drawn from different classes of society, he must choose his words so that he avoids offending any of them. If his training has been severe, he may have become so afraid of giving offence that he is forced to fall back on platitudes rather than risk the punishment that he has found will follow the candid expression of his ideas.

Individuals, of course, vary in their sensitiveness to the mental attitude of those around them. The capacity for being aware of the feelings of other people appears to be inherent and cannot be learnt by training, but its effect is to produce the type that is tactful and diplomatic when the ordinary training has not been too severe, but when it has been severe it may prevent the expression of any ideas at all.

This type is illustrated by the case of a man who had two elder brothers, the younger of whom was six years his senior. They never allowed him, during boyhood, to give expression to any ideas in the house, so that in after life, although he was an intelligent thinker, he practically never gave an opinion on any subject and was almost inarticulate.

Finally, the simple-minded man who is often in the company of superficially intellectual and brilliant talkers may get such a wrong standard of conversation and such a feeling of inferiority about his own capacity to be entertaining, that he begins to submit his ideas to a conscious scrutiny, instead of allowing the censorship to be automatic. When this happens, his ideas are phrased in the mind and one by one rejected as unworthy of expression, and in a man whose standards are too high this mental self-consciousness may produce such confusion of mind as to make any attempt to speak in public an agony to be avoided at all cost.

PUBLIC SPEAKING

To have mastered the art of speaking in public is to have attained self-confidence not only in this sphere but also in many others. Training a man so that he is able to hear his own voice raised in public without developing a paralysing self-consciousness is therefore of value to all those who are retiring and self-depreciative, and it helps in the re-education of people whose self-confidence has been undermined by a prolonged illness either physical or mental, especially anxiety neurosis. Some consideration of this subject is therefore not beneath the notice of medical men, who are called upon to treat this class of patient.

The composition of a speech depends on the subject and the occasion, and in this article it is only necessary to remark that no one should attempt to address an audience unless he has something interesting and original to say.

The art of making the voice audible to an audience can easily be learnt by anybody; yet it is lacking in most speakers. The cause of inaudibility is usually the self-consciousness already referred to, because the chief wish of the frightened animal is to hide away from others, and to raise the voice is to attract attention and to feel less safe. Therefore the adjustment of the mind to the position of isolation is a necessary part of learning to speak audibly. When this is mastered, the speaker is usually astonished at the capacity for conveying sound that he finds in his larynx, and it is a pleasant discovery. He finds himself with an instrument which he can modulate to the needs of an audience, and this is one of those elements in speaking in public which tend to remove self-consciousness. He is master of his audience inasmuch as he can use his voice to arouse or quieten their emotions, if what he has to say is something that they wish to hear, but he is also the servant of his audience in that they have a right to hear every word distinctly and without having to strain their attention.

This cannot be achieved all at once, and certain simple rules must be practised in private before attempting to address other people. The application of these rules must become habitual. So much a habit should they become that they are applied automatically and no longer need conscious thought, no matter how strong are the emotions that move the speaker. These rules are as follows:—

(1) *Speak to the member of the audience who is farthest away.*—This does not involve shouting, even with a large audience, if the other rules are properly applied. It is surprising how little effort is required to convey the sound of the voice to the furthest parts of a large building.

(2) *Keep the voice up.*—By this is meant the "placing" of the voice, which is easier to demonstrate than to describe. In ordinary conversation the vibration caused by the vocal cords can be felt by most people to be placed somewhere just above the cords themselves. The sounds produced in this position cannot be projected towards an audience.

To be heard at a distance, without effort to the speaker, the voice must be "placed" so that the vibration is felt to be above and behind the soft palate. From this position the sound of the voice can be made to carry long distances without straining. Many people find this art of placing the voice difficult to acquire, but it can quite easily be taught, and after some practice it comes to be associated with the presence of an audience, and the correct positioning of the vocal sounds becomes automatic.

The "pitch" of the voice needs to be only slightly higher than in ordinary speech, but it must not be allowed to drop below this level. The tendency to lower the tone at the end of a sentence must be carefully avoided, or the bulk of the audience will be obliged to guess at the speaker's meaning.

(3) *Give every word its full value.*—A little attention to ordinary conversation will show that most people slur or half pronounce or clip their words to avoid sounding pedantic. This practice is not fair to an audience. To be effective, public speaking must be rather more pedantic than private conversation. An audience expects this, and the speaker need not be self-conscious about it.

(4) *Speak slowly and use simple language.*—The speaker has to remember that, although he knows what is coming, the audience does not and must be given time to appreciate the meaning of words that may be unfamiliar.

(5) *Speak naturally.*

(6) In extempore speaking *prepare the first few sentences.* The reason for this is to tide over the period during which the speaker is overcoming the inevitable physical self-consciousness and finding the range and position of his voice.

(7) It is a good plan to *have in mind a suitable ending* to a speech. A sudden realisation that he has talked too long will produce embarrassment in a speaker and prevent the mind from projecting ideas ahead of the mechanism of turning them into words. This results in the speech ending lamely.

(8) *The use of the pause.*—No member of an audience minds a pause while the speaker searches for the right word to express an idea, and used in this way it is often effective in emphasising the point of a sentence.

With these rules to guide him, anyone may approach a speech in public without fearing that his manner will irritate his audience. Practice is essential if the art is to be learned so thoroughly that the speaker can express his ideas without having to interrupt their flow while he listens to his own voice and manner to make sure that his audience can hear what he is saying.

TEACHING A MAN TO SPEAK IN PUBLIC

The first part of the teaching process is definitely psychotherapeutic. A careful and thorough explanation of the physiology of the fear reaction makes it clear that the physical changes are normal and universal, that the trembling, palpitation, breathlessness, flush, sweating, sinking in the epigastrium, dry mouth, and the higher pitch of the voice are not due to any personal weakness or idiosyncrasy but are the natural consequence to all men of being made to feel isolated and separated from the herd. Once this theory has been mastered, these changes lose a great part of their power to interfere with reasoned thought. The human, like other animals, is afraid of whatever

he does not understand, and the explanatory method of treatment is the best way of dealing with physical self-consciousness, as it is in most conditions in which fear or anxiety plays a part. This explanation must be given several times and approached from various angles, until the patient is convinced of its truth, so that, when, at a later stage in the treatment, the physical self-consciousness is aroused deliberately and artificially, he can observe the changes in himself with a calm and untroubled mind and having observed them can thereafter ignore them.

The treatment of mental self-consciousness is still more definitely psychotherapeutic. Involving as it does an attitude of inferiority towards other people, it must be carefully examined and traced to its source, if it is to be eliminated.

The first step is to take a full history of the patient, bearing in mind that the basis upon which mental self-consciousness rests is a belief, generated at some stage in his history, that his thoughts and ideas are not worth expression in words. This involves a careful investigation of his home surroundings, his school life, and his later relations with other people. Any conditions during these periods which involved a lack of confidence in himself must be noted and discussed at full length with the patient, and everything is to be gained by making both the examination and the discussion as full and as complete as possible.

The value of the method lies in this fact, that throughout life, as experience becomes widened, so a man's estimate of himself with regard to other people becomes changed, and each new experience is judged by the knowledge of himself which he has at the time when the experience happens. It follows that experiences early in life can only be judged by the amount of knowledge of himself which the individual has in childhood and in youth. The mechanism of memory is such that each experience is stored in the mind with all its associations and emotional content, just as it happened, and when the memory is recalled the original emotion is felt again. Any memory of expressing ideas, which has as its emotional content a feeling of humiliation and distress, will reproduce that feeling in the body when it is recalled. If this has been the early experience of the patient, then any attempt to express ideas in public will recall the feeling of humiliation and add to the state of physical distress.

If, however, the early experience is brought into contact with present-day reasoning and the adult sum of self-knowledge, a new attitude is developed towards it, and when the painful experience, after this treatment, is returned to memory it carries with it a new emotional attitude, half humorous, half tolerant of the failures of childhood, and an awareness that the humiliating experience of the child was not so great a disaster as it then appeared. In this way the original and painful emotional content of the memory is removed.

By these two essentially psychotherapeutic methods the patient is rid of psychological inhibitions to speaking in public and prepared for the final stages of training as a fluent speaker.

TRAINING THE VOICE

Vocal training can go on side by side with the psychological treatment and is not a separate treatment; nor is it effective without ensuring that the emotional inhibitions are removed.

The training of the voice involves getting used to hearing his own voice raised before other people, placing the voice, and acquiring a good manner. The first steps in acquiring these arts are best carried out in the quiet of the consulting-room. The patient has become used to the practitioner's presence, and their conversations have removed much of the patient's self-consciousness. Reading aloud makes the best exercise for beginning the study of the art of speaking, and the choice of subject can at first be left to the patient, but the reports of political speeches either of the past or of the present day are a good medium if they are reported in the first person. The patient stands at the greatest distance from the practitioner that is available and having gone over carefully the rules about the manner of speaking he must visualise an audience and begin to read. Most men in this situation feel as if they are back at school, and this offers a good opportunity for recalling early memories of boyhood humiliations and dealing with them at the present-day conscious level.

When this has been accomplished on several occasions, the proper use of the voice can be studied. If the patient can visualise an audience properly he naturally raises his voice, and he will usually find that he has placed it in the best position to make it carry, and when the first embarrassment, caused by hearing his own voice sounding so clearly, has passed off, he is greatly encouraged. If he cannot achieve this at the beginning, the right position for the voice must be demonstrated to him, while he imitates the sound, until he comes to feel the vibration in the part of his vocal apparatus where he can get the greatest volume of sound without straining. The patient can always recognise the moment when he has produced "the speaker's" voice.

Any tendency to shout must be controlled, but the difference between a properly placed voice and shouting will soon become evident to the patient himself. The exercise of reading aloud can continue until he has become so accustomed to using his voice in the right manner that he speaks correctly whenever he begins to read, without any prompting, and until he is following the rules already mentioned habitually and automatically.

This is followed by reading a speech which he has himself prepared, later by speaking without notes on a subject of his own choice, and finally on a subject of general interest chosen for him. During these later stages he is permitted to practise alone, and this is often best carried out in the open air, where he has space to use his voice and is not embarrassed by an audience.

Lastly he must take every opportunity of addressing an audience. At first there will be failures in greater or less degree. He will make speeches without saying anything that he intended to say, he will show signs of embarrassment, and he will end his speeches lamely. These failures show that his physical reactions are interfering with clear thinking by occupying consciousness, but with increasing experience these difficulties will disappear as he learns to recognise the emotional changes for what they are and comes to ignore them.

Nothing gives a man confidence in his dealings with his fellows so much as the knowledge that he is ready at any time to make a good and effective speech on any subject with which he is familiar and to any size and class of audience. To the audience he will appear as a public benefactor.

THE LIFE OF LISTER.—The British Broadcasting Corporation announce that on Jan. 21 they will broadcast a play entitled "Revolution in the Infirmary," dealing with the life of Joseph Lister from 1861 to 1895. It is written by Howard Jones and produced by John Gough.

PROF. GADDUM ON HORMONES

IN a paper on Recent Discoveries about Animal Hormones read before the Pharmaceutical Society on Jan. 10, Prof. J. H. Gaddum reviewed the present knowledge of hormones. He divided them into three classes: derivatives of tyrosine, steroid hormones, and hormones of unknown structure. The first class included adrenaline and thyroxine. Clutton, Harington, and Yuill, it was pointed out, had linked thyroxine chemically to various proteins and used the resultant substance as an antigen, which, injected into rabbits, produced antibodies that not only combined with the antigen but also neutralised the effects of thyroxine injected into rats. Sera prepared thus might prove to be an effective antidote to hyperthyroidism. This method of linkage with proteins to form antigens might be extended to other drugs also. The steroid hormones included the sex hormones (androgens and œstrogens), the pregnancy hormone (progesterone), and the hormones of the suprarenal cortex (corticosterone and desoxycorticosterone). Hormones of unknown structure included the intestinal hormones (secretin, gastrin, enterogastrone, cholecystokinin, and villikinin), the pancreatic hormone (insulin), and the active principles of the parathyroids, thymus, and pituitary. The actions of practically all of this group were apparently associated with the protein fractions of the extracts, and it was doubtful whether it would ever be possible to synthesise them. The numerous hormones of the pituitary were classified according to the part of the gland that produced them. Extracts of posterior lobe contained two (if not three) active substances, of which one caused contraction of the uterus in mammals and another caused constriction of capillaries and contraction of intestine. They also had an antidiuretic effect, but it was not certain that their effect was not due to a separate active substance. The pars intermedia contained a hormone that controlled the melanophores of frogs. The anterior lobe contained many hormones, of which some produced general and others local effects. Among the former effects were gigantism, diabetes, and increased formation of ketone bodies. The specific local effects were exerted mostly on other glands, such as suprarenals, thyroid, parathyroid, and gonads. The anterior lobe produced two gonadotropic hormones (the follicle-stimulating Prolan A and the luteinising Prolan B); the lactogenic prolactin; a thyrotropic hormone; and an adrenotropic hormone.

"All this work on hormones," said Prof. Gaddum, "is putting powerful weapons in the hands of the practical worker. The possible uses of these weapons are still largely unknown, but they will not necessarily be limited to the treatment of diseases of the glands. . . . The synthesis of new substances, allied in chemical structure to the natural hormones, is likely to lead not only to cheaper ways of producing the effects of the hormone itself but also to the discovery of new pharmacological effects, like those of benzedrine and ephedrine on sleep, and of better methods of administration, like the taking of these substances by the mouth. . . . These new weapons have their limitations and dangers. The development of antihormones limits the use of many of the active substances in anterior-pituitary extracts and may perhaps constitute a danger by making the animal insensitive to the very hormone whose effect is desired. On the other hand, when more is known about them, antihormones, either administered by injection or developed by the patient himself, may be powerful therapeutic weapons. The need for caution in the use of hormones is emphasised by the fact that large doses may produce permanent changes in the glands."

TUBERCULOSIS IN TUNISIA

ACCORDING to Dr. M. H. Thamer (*Thèse de Paris*, 1938, No. 365) tuberculosis in Tunisia is increasing every year at an alarming rate and is now responsible for more than a third of the deaths from epidemic diseases. The total population of the country is about 2½ million, of which 2¼ million are Mussulmans, 60,000 Tunisian Jews, and 200,000 Europeans. It is the Mussulmans who are most liable to tuberculosis and show the highest mortality-rate; 0·59 per cent of them are said to be affected compared with 0·25 among the Europeans. Moreover, the great majority of cases are of the ulcerocaseous type, are highly contagious and with rapid course.

At the present time the means for combating the disease are quite inadequate. The only institution for detecting cases is the Mussulman dispensary at Tunis, while barely 84 beds are available for all the cases of pulmonary tuberculosis in a population of more than 2 million, among whom there are more than 6000 deaths from tuberculosis annually. There are at present no institutions for the prevention of tuberculosis among Mussulman children. In Dr. Thamer's view the following measures are urgently required. For children, the creation of open-air schools, holiday colonies, and a preventorium. For adults, the establishment of five sanitary districts for Tunis, Susa, Sfax, Kef, and Bizerta respectively, with a tuberculosis dispensary in each, the provision of about 50 hospital beds, and a sanatorium of 100 beds in the suburbs of Tunis. The anti-tuberculosis campaign should later be extended to the smaller towns and the rural districts, which contain about three-quarters of the total population of the country.

COMPENSATION FOR ACCIDENTS IN MINES

ANSWERING Mr. Robert Taylor in the House of Commons, the Secretary for Mines made a useful tabular statement of the extent of accidents underground and their cost to the community. The figures relate to all accidents in mines, including metalliferous mines, for which compensation was paid under the Workmen's Compensation Acts.

Year	Number of cases		Amount of compensation	
	Fatal	Disablement	Fatal	Disablement
			£	£
1931	·996	170,887	308,512	2,092,452
1932	907	154,355	272,232	2,007,389
1933	901	147,441	278,972	1,868,117
1934	906	158,852	276,034	1,937,489
1935	1,235	161,509	376,141	2,070,726
1936	888	164,905	273,221	2,205,679
1937	914	169,250	274,313	2,188,109

ANTITOXIN WITH TOXOID IN DIPHTHERIA

TREATMENT of diphtheria with antitoxin and anatoxin (toxoid) in association is described by H. Sohier and C. Jaulmes (*Bull. Soc. méd. Hôp. Paris*, 1938, **54**, 1378) who treated 11 soldiers in this way. As soon as diphtheria was diagnosed the patient was given a subcutaneous injection of 0·1 c.cm. of toxoid and an hour later he had a large dose of antitoxin. A second dose of toxoid, usually 0·5 c.cm., was given forty-eight hours after the first, and five days later a third injection of 0·5–1 c.cm. of toxoid was given, followed by a fourth ten days after the third. The results were satisfactory: rapid and uncomplicated recovery took place; the reactions sometimes following toxoid were never seen; and active immunity quickly developed, as shown by the high antitoxin content of the serum. R. Martin, A. Delaunay, and R. Richou (*Ibid*, p. 1384) used the same method in 12 cases of diphtheria in children with the following results: complications were rare; there was only 1 case of paralysis, which was mild; and active as well as passive immunisation was obtained. H. Darré and A. Laffaille (*Ibid*, p. 1405) obtained similar results with the combined treatment in 33 cases of diphtheria in children.

CARCINOGENESIS BY THOROTRAST

SOME four years ago Roussy, Oberling, and Guérin showed that Thorotrast (a colloidal solution of thorium dioxide) is carcinogenic, and in 1936 F. R. Selbie reported in our columns that its injection had produced spindle-celled sarcomas in 14 out of 60 rats. Continuation of this work at the Imperial Cancer Research Fund's laboratories and elsewhere has proved that thorotrast in small doses will produce sarcomas at the site of injection in a large proportion of rats and mice, and the latest report of the director, which we reviewed on Dec. 31 last (p. 1548), records that in guinea-pigs Dr. L. Foulds has induced a glandular carcinoma by the same means.

In Italy O. Onufrio has been repeating the experiments of Roussy, Oberling, and Guérin and of Selbie on rats and mice, and he will publish his results later. Meanwhile he reports (*Folia med., Napoli*, Nov. 30, 1938, p. 1245) a reticulosarcoma observed in a rabbit after intravenous injection of thorotrast. Radiography a few weeks after the injection showed no abnormality in liver or spleen; but radiography more than two years later showed nodules in liver and spleen. The neoplasm developed after thorotrast had been injected in two big doses (6 c.cm. of thorium per kg. body-weight) separated by an interval of two days, and though this rabbit was one of six treated similarly, it was the only one showing disease two years later. Nevertheless Onufrio, like Selbie, concludes that thorotrast should never be injected into the human body.

THE SAFE PERIOD

WRITERS of books and papers on the so-called "safe period" fall into two groups. In the first are those who contend that the existence of a sterile period during the menstrual cycle is the expression of a natural law. This dispenses with the necessity of using contraceptives, which they regard as being morally reprehensible and æsthetically objectionable. Those in the second group have no opinions on the moral aspects of contraception, and base their views on observations they have made on the chances of conception occurring throughout the cycle. The first group conclude that the seven or eight days preceding the menstrual period and a variable number of days, averaging about seven, following it are sterile, and that their sterility can be counted upon with almost complete certainty by the majority of women. The second group maintain that whereas the chances of conception are less at certain parts of the cycle than at others, these improbabilities can never safely be regarded as amounting to certainties. The writers of the first group usually ignore, in their bibliographies, the contributions of the second. Mr. D. Murray Davey belongs to the first group. His booklet (Family Limitation: The Natural Way. Wales Publishing Co., 1938, Pp. 48, 1*s*.) epitomises the findings of Knaus, Ogino, Holt, and Smulders without adding anything new.

MALARIA IN PALESTINE

Dr. Léon Kornic, who has devoted an inaugural thesis (*Thèses de Lyon*, 1937–38, No. 474) to this subject, states that Palestine is very poorly supplied with water. The breeding-places for the anopheles are closely dependent upon the rainfall, and their nature varies with the configuration of the soil. Roughly they may be classified as cisterns in the table-land, wadis and springs at the foot of the hills, and marshes in the plains. Eight varieties of anopheles are encountered in Palestine, but only four are of importance as malaria carriers—viz., *A. elutus*, *A. sergenti*, *A. superpictus*, and *A. bifurcatus*—the last being confined to districts where drinking-water is supplied by cisterns. Malaria in Palestine is mainly a disease of the second half of the year, most of the cases occurring in July and August. The intensity of the epidemic declines in September, but a fresh outbreak develops in October, though smaller than the preceding one. The course of the epidemic runs parallel with the life-cycle of the anopheles, the epidemic period coinciding with the period of existence and activity of these mosquitoes.

The study of the social factor is particularly important in Palestine in view of the mixed character of the population. The Jewish inhabitants show a high epidemic incidence with a low endemic rate, while just the contrary is to be found among the Arabs. Moreover the movements of the population, exemplified by the Bedouins and farm labourers and the arrival of the immigrants who have not had the disease, largely contribute to the spread of malaria. At the present time there is a general diminution of the incidence of the disease in Palestine. The relation of cases of malaria treated in the government dispensaries to other diseases, which was 7·17 per cent. in 1922, was only 0·83 in 1934. The campaign against malaria in Palestine consisted almost entirely in destruction of the larvæ after a local epidemiological investigation. The prophylactic use of quinine was only exceptionally carried out, whereas the gratuitous supply of quinine per case yearly amounted to 16 grammes.

THE STUFF WE'RE MADE OF

IT would be amusing to know what general readers themselves really think about popular scientific works, and whether they enjoy being put back in the nursery, or jovially slapped on the back and convivially treated to what turns out, after all, to be sulphur water. If they abhor these attempts at ingratiation they should read "The Stuff We're Made Of,"[1] which succeeds in being instructive without being condescending, witty without being smart, and interesting without being ludicrous. Every doctor, too, should humbly put down his seven-and-sixpence and digest this excellent book for the good of his soul. None but professional biochemists could read it without experiencing a sense of revelation and a feeling akin to awe at the exploits of their colleagues during the last few years. It contains information about hormones, vitamins, drugs, enzymes, viruses, and the like with which every doctor should be acquainted. Complicated formulæ are given without apology, and none is needed, though the general reader may founder on them. We do not wholly understand them, but they give us the feeling of something tangible and we retain a sufficient smattering of chemistry to see when two of them look alike, and that is all we are asked to see. The range of the book extends beyond themes of purely medical interest, and its perspective is so striking that the reader feels he has glimpsed the world from an unexpectedly novel and important vantage point.

CONSERVING THE HAIR

BRUSH, comb, and wash your hair properly and you will keep it; eat plenty of fresh fruit and vegetables and your hair will not go grey. This in brief is the message of a little volume by Mr. John W. King (Give Your Hair a Chance. London: Putnam and Co. 1938. Pp. 117. 2*s*. 6*d*.), and his advice is so simple that it might be worth a trial! The rest of his book is mainly devoted to warnings against patent hair-restorers, dandruff cures, and hair dyes; most of which is sound. But if his paragraph on the average hairdressing establishment is taken too seriously, it would be frightening to have a haircut again.

A CASE OF EPILEPSY

Dr. E. P. POULTON writes (from 25, Upper Wimpole Street, London, W.1): "I am anxious that a new form of treatment for epilepsy should be tried. It is not easy to find a suitable case. The patient would be nursed in a general ward and there should be several fits a day. Can any of your readers help me?"

[1] By W. O. Kermack, D.Sc., LL.D., research laboratory, Royal College of Physicians, Edinburgh; and P. Eggleton, D.Sc., lecturer in biochemistry, the University, Edinburgh. London: Edward Arnold and Co. 1938. Pp. 342. 7*s*. 6*d*.